1226-6

CROUSE-HINDS

Airport Lighting Equipment

IMPORTANT NOTICE

This catalog is registered in the name of:—

Name: Mr. Alfred L. Wolf, Exec. Dir.

Firm Name: City of Philadelphia, Airport Comm.

Street: Room 1023, City Hall Annex

City: Philadelphia

State: Pennsylvania

We would like to keep this catalog up-to-date. Therefore, please notify us immediately of any change in address or ownership.

CROUSE-HINDS COMPANY,
Syracuse, New York.

CROUSE-HINDS

AIRPORT LIGHTING EQUIPMENT

SCHEDULE "A"

TRADE DISCOUNT SHEET

Dated and Effective Midnight, March 14, 1937 — **No. APR-2**

		Discount	Multiplier
Discounts	All Buyers	On Application	

Terms

Note 1. Net 30 days with no cash discount for prepayment.

Delivery

Note 2. Airport Lighting Equipment is sold f. o. b. common carrier, Syracuse, New York, with freight prepaid to any regular freight station on a common carrier in the United States. Orders for repair parts only will be shipped collect. No transportation allowance will be made.

Freight Charges

Note 3. Zone 1. No charge will be made to cover delivery by freight on shipments into Zone 1.

Note 4. Zone 2. An amount equal to 1% of the list value of the shipment will be added as a net amount to the face value of the invoice to cover transportation charges.

Note 5. Zone 3. An amount equal to 2½% of the list value of the shipment will be added as a net amount to the face value of the invoice to cover transportation charges.

Example

Note 6.

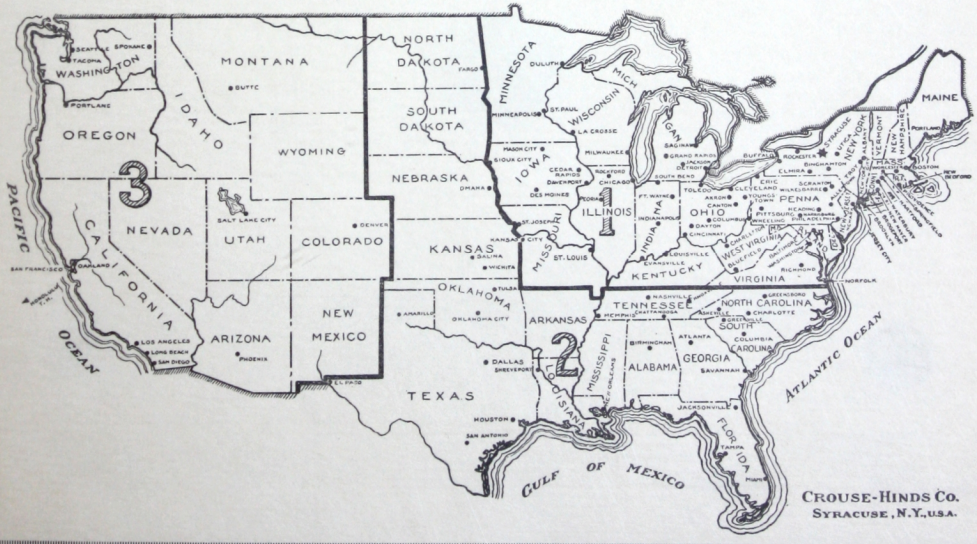
Assuming an article lists at $1250.00 and assuming discount is 50%	$625.00
Add for Zone 2 freight charges 1% of $1250.00	12.50
Total Price delivered in Zone 2	$637.50

Express Shipments

Note 7. Airport Lighting Equipment ordered by express will be forwarded with transportation charges prepaid. To the net delivered price of the equipment so ordered there will be added a net amount representing the difference between the actual express and actual freight transportation charges.

Note 8. Crouse-Hinds Company will use its own discretion in routing all shipments upon which it assumes transportation charges. Shipments will be made in any manner requested by the customer, if the customer will assume the extra transportation costs.

Map Defining Airport Zones



CROUSE-HINDS CO.
SYRACUSE, N.Y., U.S.A.

CROUSE-HINDS

AIRPORT LIGHTING EQUIPMENT

Catalog 317

March 15, 1937

(Supersedes Previous Listings)

(NOTE: Dimensions in this Catalog are not guaranteed. They have been compiled with care, in most cases to the nearest eighth of an inch, and are sufficiently accurate for most purposes. Dimensions are subject to change without notice.)

CROUSE-HINDS COMPANY

ESTABLISHED 1897

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Airport Lighting Equipment

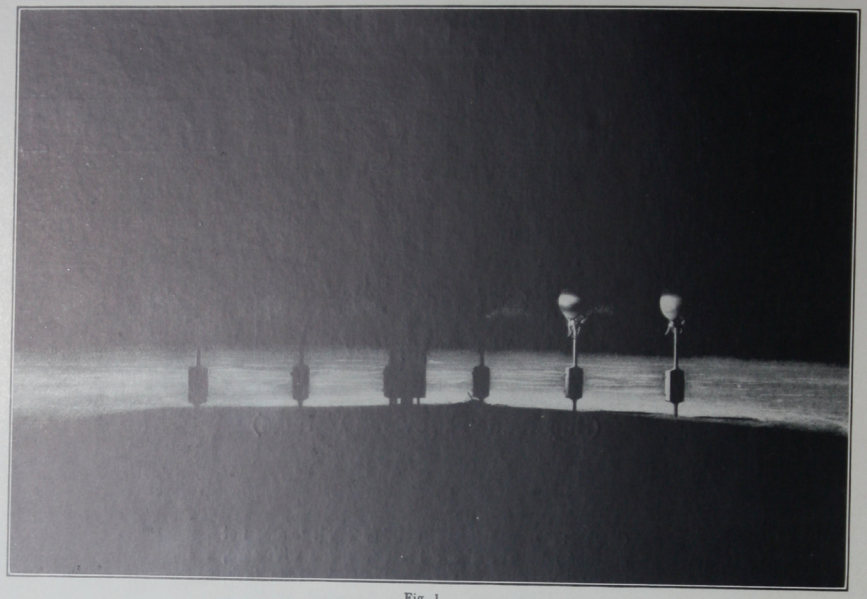


Fig. 1
Landing Field Illumination
Springfield Airport—Springfield, Massachusetts

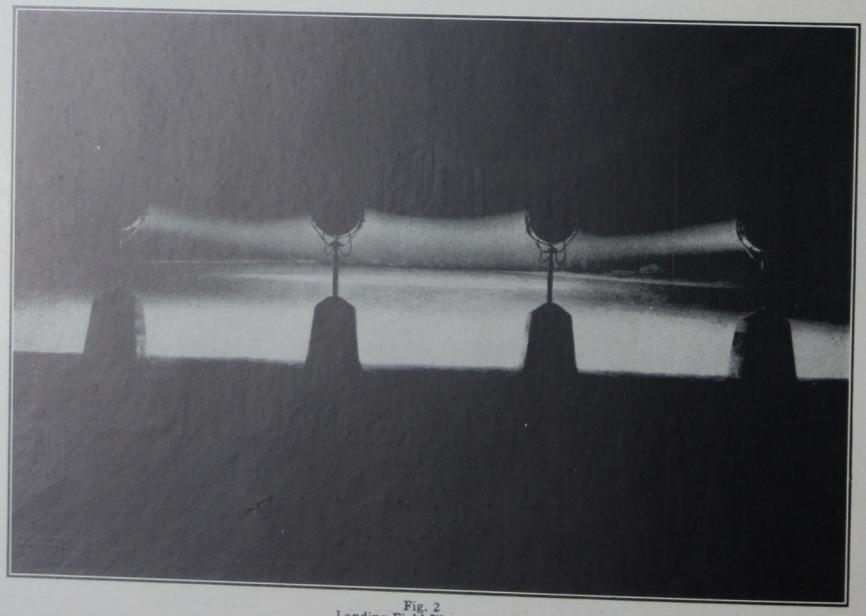
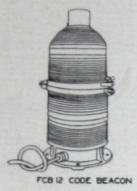


Fig. 2
Landing Field Illumination
Fresno Airport—Fresno, California

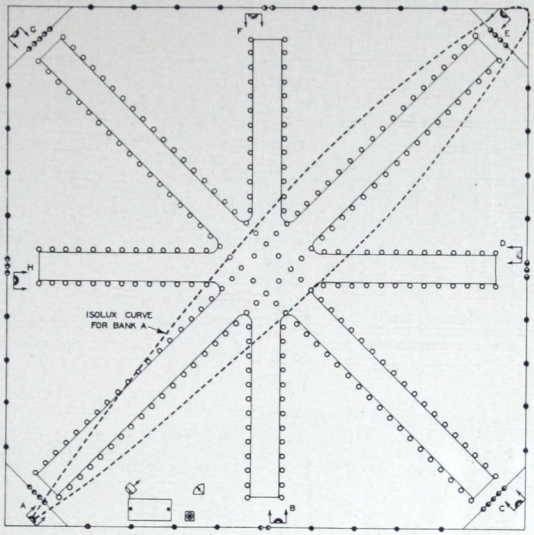
CROUSE-HINDS

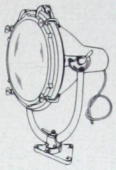
Airport Lighting Equipment

General Requirements

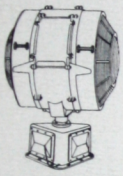


FCB 12 CODE BEACON

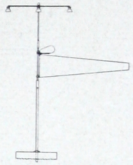




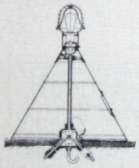
ADE 16, APRON FLOODLIGHT



● DCB 36 REVOLVING BEACON

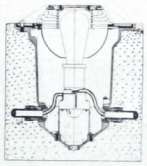


WIND CONE INSTALLATION

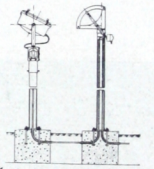


● APB BOUNDARY LIGHT
◐ APB RANGE LIGHT

DCE 24 FLOODLIGHT INSTALLATION



○ CPD CONTACT LIGHT INSTALLATION



DCE 16 CEILING PROJECTOR INSTALLATION

Fig. 1

The drawing above shows a typical modern airport with the principal items of lighting equipment required for proper night operation. The various types of equipment required are enumerated below. Reference to the catalog pages on which complete descriptions and listings will be found, are given.

CROUSE-HINDS

Airport Lighting Equipment

Fig. 2
Landing Field Illumination
Clover Field Airport—Santa Monica, California

Fig. 3
Hangar Illumination
Syracuse Airport—Syracuse, New York

CROUSE-HINDS

Type DCB-36 Rotating Beacons

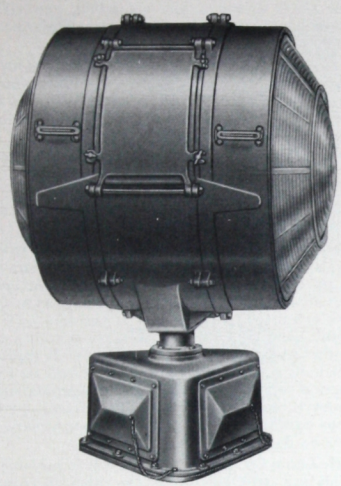


Fig. 1
Type DCB-36

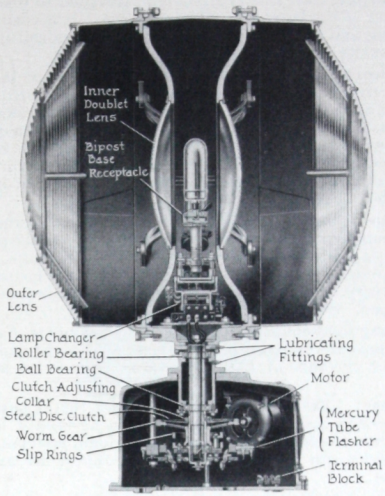


Fig. 2
Type DCB-36—Sectional View

Type DCB-36 is a rotating beacon of unusually high efficiency, 36 inches in diameter, which projects beams of light in two directions, 180° apart. Because of this large diameter and efficient optical system, type DCB-36 produces a more powerful beam than the old 24-inch beacon; and its double beam gives twice as many flashes.

The optical system consists of a lens combination in each end of the housing, with a single lamp in the center. See Fig. 2. Each combination consists of an 18-inch inner doublet lens and a 36-inch outer lens. The outer lens is made of a one-piece, bull's-eye lens, 20 inches in diameter, surrounded by twelve 30° sectors of an annular ring. When color is required in either or both ends of the beacon, the inner doublet lens is furnished in red or green.

Type DCB-36 rotating beacon meets the specifications of the Department of Commerce for airport beacons, when equipped with one end clear and one end green, and rotated at 6 R.P.M.

Installation of Rotating Beacons

The rotating beacon at an airport must be mounted higher than any surrounding obstruction. The roof of a hangar or administration building is sometimes suitable; in other cases, a steel tower is required. The bottom edge of its beam, when set horizontally, should clear all obstructions. A leveling boss is provided on the top of the base housing.

Wiring: Separate circuits for control of the motor and the beacon lamp should be run to a panelboard which can be installed on the tower, either at the top or at the base. The motor circuit should be fused separately with a 10-ampere fuse.

Voltage: Large incandescent lamps are very sensitive to changes in voltage. When the lamp is burning, the voltage at the terminals of the lamp receptacle should be within 1 to 2% of the rated voltage of the lamp. A drop of 10% will reduce the light output 31%, while a rise of 10% will shorten the lamp life 72%.

Advertising Beacons

Beacons which are not located at airports and are installed for advertising purposes must be approved by the Department of Commerce, Airways Division, before installation. Type DCB-36 beacon can be used for this purpose. The speed of rotation required is 1 R.P.M., and both beams of the beacon must be red in color.

In addition to the rotating beacon, it is necessary to install a 24-inch fixed directional searchlight with automatic lamp-changer, with the white beam pointing towards the nearest airport. Type DCE-24 searchlights, listed in Floodlight Catalog 316, section 205, meet this requirement.

	Description	Cat. No.
DCB-36	Standard Beacon, 6 R.P.M.	41281
	Advertising Beacon, 1 R.P.M.	41304

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Type DCB-36 Rotating Beacons

Housing: Cast silicon aluminum, designed to dissipate the heat of the lamp without ventilation. It is corrosion-resisting and will not require painting for protective purposes under normal conditions.

Optical System: Consists of a lens combination in each end of the housing, with a single lamp in the center. Each combination consists of an 18-inch inner doublet lens and a 36-inch outer lens. The outer lens is made of a one-piece, bull's-eye lens, 20 inches in diameter, surrounded by twelve 30° sectors of an annular ring. When color is required in either or both ends of the beacon, the inner doublet lens is furnished in red or green.

Lamp-Changer: A magnetic lamp-changer is provided to automatically throw into focus and connect to the power source, a spare lamp upon failure of the first lamp. The lamp receptacles are the Bipost type which are focused at the factory. No focusing is required when the beacons are relamped. See section 307, page 3.

Wiring Connections: Separate leads for motor, flasher, and lamps are brought to a terminal block in the base. A hole for entrance of 1¼-inch conduit is provided in the base.

Lamps: 1000-watt, T20-bulb, 110-volt, Bipost base airway beacon lamps. 30-volt lamps can be used if lamp-changer is ordered with 30-volt coils. Mogul prefocus base receptacles can be furnished, but the Bipost are recommended.

Base: The base is of cast aluminum alloy, of rugged design, and contains motor, slip rings, and clutch. The mechanism is exposed for inspection by the removal of the three plates on the sides of the base.

Beam Elevation: The beams of the type DCB-36 beacon can be raised or lowered by raising or lowering the lamps. Lowering the lamps raise the beams but the normal setting is with the beams elevated 1.25° above the horizontal.

Rotating Mechanism: The motor is connected to a vertical shaft through a worm gear and slip clutch, which are designed to rotate the beacon at 6 or 1 R.P.M. as specified.

Motor: ⅙-horsepower, 110-volt, 60-cycle. Special motors for other voltages and frequencies can be supplied, if specified on the order.

Gear: A bronze worm (Cat. No. HL4390) attached to the motor shaft drives a micarta worm gear (Cat. No. HL4391), which is attached to the beacon shaft through the clutch. See section 307, page 3.

Clutch: A steel disc clutch connects the worm gear to the beacon shaft. It is designed to protect the motor and gear from damage, and is of adequate strength to turn the beacon under all conditions of wind and weather. The clutch tension is adjustable.

Bearings: Upper bearing—thrust-type tapered roller bearing.

Lower bearing—heavy duty radial ball bearing.

Alemite fittings are provided for greasing the bearings.

Flasher: A code flashing mechanism for controlling a code beacon can be furnished. This flashing mechanism consists of a mercury tube on a tilting mechanism which is operated by a cam on the bottom of the vertical shaft. Characteristic signals are based on Morse dots and dashes. The flasher is limited to a period of 10 seconds for 6 R.P.M. beacons, and the code is flashed once per revolution. Some codes require longer periods. A separate code flasher (type TSS-16, listed on page 5 of this section) can be furnished for any period required. A flashing mechanism employing two mercury tubes can be furnished for flashing two separate course lights when specified. The standard airport beacon has no flasher.

Tell-Tale Lamp Circuit: It is quite advantageous to have a red indicating light located in the office in front of the night operator, so that he is informed immediately when the beacon needs to be relamped. This is accomplished with a "lock-in" relay mounted inside the beacon housing. An extra slip ring provides a third contact in the base so that the indicating circuit can be run to any remote point. When a lamp burns out and a new lamp is thrown into the circuit, the "lock-in" relay closes, thus operating the red warning light until the beacon is relamped. When the lamp-changer is relamped and reset in its operating position, the relay automatically resets itself. **This relay is standard equipment.**

Finish: Aluminum.

Net Weight: 515 lbs.

Shipping Weight: 825 lbs.

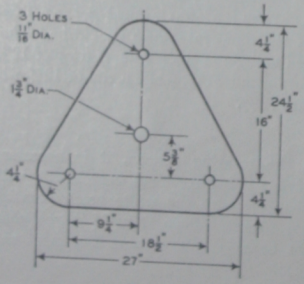


Fig. 3
Base Dimensions—Type DCB-36

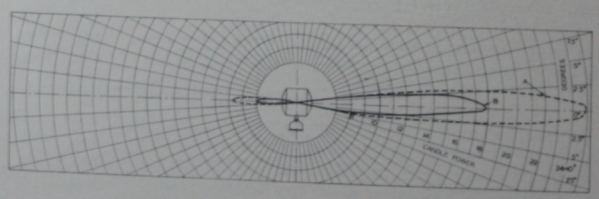


Fig. 4
Distribution Curve—Type DCB-36
Curve to the Left is with Green Lens
Curve to the Right is with Clear Lens
Curve A is with 30-Volt, 1000-Watt Lamp
Curve B is with 110-Volt, 1000-Watt Lamp

CROUSE-HINDS

Types DCB-224 and DCB-24 Rotating Beacons

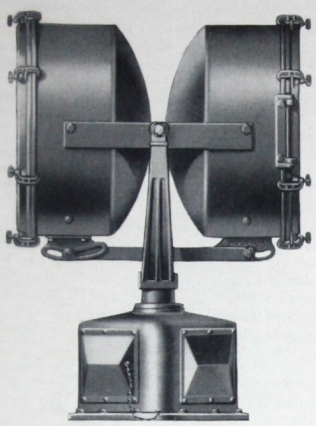


Fig. 1
Type DCB-224
Double-End Beacon

Fig. 2
Type DCB-24
Single-End Beacon

Type DCB-224 is a rotating beacon having two 24-inch searchlight housings, so mounted as to throw their beams 180° apart. Each of the units is equipped with an automatic lamp-changer and a 500-watt lamp.

The optical system of the beacon consists of a 24-inch diameter, commercial precision silvered glass reflector, and an auxiliary spherical reflector which reflects the spill light back onto the main reflector. The lens of the clear unit is a three-sector plate glass lens, while the other unit has a green lens. This beacon meets the Department of Commerce Performance Specifications for airport beacons.

Type DCB-24 single-end beacon is the original airways beacon, and the majority of the airway beacons are still of this type. However, the latest Department of Commerce specifications require that an airport beacon be of the double-end type. Therefore, the principal uses of the DCB-24 beacon are for marking hazardous flying areas, and for advertising purposes.

Installation of Rotating Beacons

The rotating beacon at an airport must be mounted higher than any surrounding obstruction. The roof of a hangar or administration building is sometimes suitable; in other cases, a steel tower is required. The bottom edge of its beam, when set horizontally, should clear all obstructions. A leveling boss is provided on the top of the base housing.

Wiring: Separate circuits for control of the motor and the beacon lamp should be run to a panelboard which can be installed on the tower, either at the top or at the base. The motor circuit should be fused separately with a 10-ampere fuse.

Voltage: Large incandescent lamps are very sensitive to changes in voltage. When the lamp is burning, the voltage at the terminals of the lamp receptacle should be within 1 to 2% of the rated voltage of the lamp. A drop of 10% will reduce the light output 31%, while a rise of 10% will shorten the lamp life 72%.

Advertising Beacons

Beacons which are not located at airports and are installed for advertising purposes must be approved by the Department of Commerce, Airways Division, before installation. Type DCB-24 can be furnished for this purpose. The speed of rotation required is 2 R.P.M., and the beam of the beacon must be red in color.

In addition to the rotating beacon, it is necessary to install a 24-inch fixed directional searchlight with automatic lamp-changer, with the white beam pointing towards the nearest airport. Type DCE-24 searchlights, listed in Floodlight Catalog 316, section 205, meet this requirement.

Beacons for Marking Hazardous Areas

The most effective way to mark a major hazardous area, such as radio stations having a number of high towers, oil fields having high derricks, tank farms, and highly-explosive areas, is to install one or more beacons with red lenses rotating at 6 R.P.M. A red beacon at this speed of rotation is recognized by aviators as marking a hazardous area from which they must keep away. Type DCB-24 beacon can be furnished for this purpose.

	Description	Cat. No.
DCB-224	Double-End Beacon, 6 R.P.M	43089
DCB-24	Single-End Beacon, 6 R.P.M. for Marking Hazardous Areas	43090
	Single-End Beacon, 2 R.P.M. for Advertising Purposes	43091

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Types DCB-224 and DCB-24 Rotating Beacons

Housing: Cast silicon aluminum, designed to dissipate the heat of the lamp without ventilation. It is corrosion-resisting and will not require painting for protective purposes under normal conditions.

Optical System: Consists of a 24-inch diameter, commercial precision silvered glass reflector, and an auxiliary spherical reflector which reflects the spill light back onto the main reflector. The lens of the clear unit is a three-sector plate glass lens, while the other unit has a green lens.

Lamp-Changer: A magnetic lamp-changer is provided to automatically throw into focus and connect to the power source, a spare lamp upon failure of the first lamp. The lamp receptacles are the Bipost type which are focused at the factory. No focusing is required when the beacons are relamped. See section 307, page 3.

Wiring Connections: Separate leads for motor, flasher, and lamps are brought to a terminal block in the base. A hole for entrance of 1¼-inch conduit is provided in the base.

Lamps: DCB-224—500-watt, T24-bulb, 110-volt Mogul Bipost base lamps.

DCB-24—1000-watt, T20-bulb, 110-volt Bipost base, airway beacon lamp. Lamp-changer can be furnished for 30-volt lamps. Mogul prefocus base receptacles can be furnished, but the Bipost are recommended.

Base: The base is of cast aluminum alloy, of rugged design, and contains motor, slip rings, and clutch. The mechanism is exposed for inspection by the removal of the three plates on the sides of the base.

Beam Elevation: Types DCB-224 and DCB-24 beacon housings are mounted in trunnion arms of cast aluminum alloy. A quadrant on the bottom of the housing is graduated from minus 10 to plus 10°.

Rotating Mechanism: The motor is connected to a vertical shaft through a worm gear and slip clutch, which are designed to rotate the beacon at 6 or 2 R.P.M. as specified.

Motor: ⅙-horsepower, 110-volt, 60-cycle. Special motors for other voltages and frequencies can be supplied, if specified on the order.

Gear: A bronze worm (Cat. No. HL4390) attached to the motor shaft drives a micarta worm gear (Cat. No. HL4391), which is attached to the beacon shaft through the clutch. See section 307, page 3.

Clutch: A steel disc clutch connects the worm gear to the beacon shaft. It is designed to protect the motor and gear from damage, and is of adequate strength to turn the beacon under all conditions of wind and weather. The clutch tension is adjustable.

Bearings: Upper bearing—thrust-type tapered roller bearing.

Lower bearing—heavy duty radial ball bearing.

Alemite fittings are provided for greasing the bearings.

Flasher: A code flashing mechanism for controlling a code beacon can be furnished. This flashing mechanism consists of a mercury tube on a tilting mechanism which is operated by a cam on the bottom of the vertical shaft. Characteristic signals are based on Morse dots and dashes. The flasher is limited to a period of 10 seconds for 6 R.P.M. beacons, and the code is flashed once per revolution. Some codes require longer periods. A separate code flasher (type TSS-16, listed on page 5 of this section) can be furnished for any period required. A flashing mechanism employing two mercury tubes can be furnished for flashing two separate course lights when specified. The standard airport beacon has no flasher.

Tell-Tale Lamp Circuit: It is quite advantageous to have a red indicating light located in the office in front of the night operator, so that he is informed immediately when the beacon needs to be relamped. This is accomplished with a "lock-in" relay mounted inside the beacon housing. An extra slip ring provides a third contact in the base so that the indicating circuit can be run to any remote point. When a lamp burns out and a new lamp is thrown into the circuit, the "lock-in" relay closes, thus operating the red warning light until the beacon is relamped. When the lamp-changer is relamped and reset in its operating position, the relay automatically resets itself. **This relay is standard equipment.**

Finish: Aluminum.

Net Weights: DCB-224, 455 lbs. DCB-24, 335 lbs.

Shipping Weights: DCB-224, 745 lbs. DCB-24, 460 lbs.

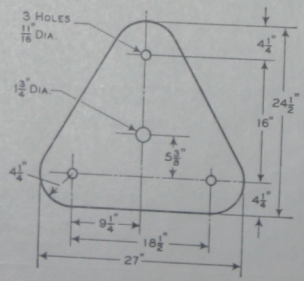


Fig. 3
Base Dimensions—Type DCB

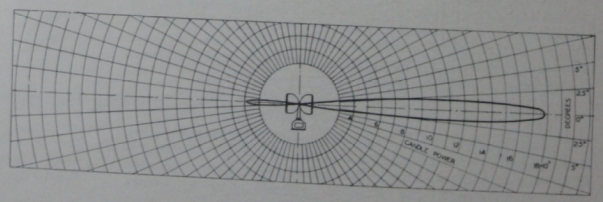


Fig. 4
Distribution Curve
Type DCB-224 with Clear Lens and 500-Watt, 110-Volt Lamp
Curve to the Left is with Green Lens
Curve to the Right is with Clear Lens

CROUSE-HINDS

Types FCB-12 Beacons and TSS-16 Switches

For Flashing Code and Marking Obstructions

Fig. 1
Type FCB-12 Beacon

Fig. 2
Type FCB-12 Beacon
Open for Relamping

Fig. 3
Type TSS-16 Switch

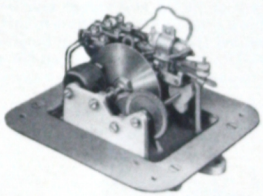


Fig. 4
Type TSS-16 Switch
Cover Removed showing Mechanism

Type FCB-12 is designed for use as an auxiliary code flashing beacon at airports, and as a marker light for major obstructions to air navigation. When used at airports, it is usually equipped with green color screens and two 500-watt lamps, and flashes a Morse code signal, designating the airport. This code signal consists of from one to three letters and must be approved by the Department of Commerce. It should be mounted high enough to allow its beam to clear surrounding obstacles.

When used to mark major obstructions, such as radio towers, supporting towers of transmission line spans crossing navigable waters, and bridge towers, type FCB-12 beacon should be equipped with 200 or 500-watt lamps as required by Department of Commerce Regulations, and red color screens; and it should not be flashed. When used to mark hazardous flying areas, such as oil fields, oil tank farms, or highly-explosive danger areas, type FCB-12 should be equipped with 500-watt lamps and red color screens; and should be flashed. A complete summary of Department of Commerce Requirements for marking obstructions will be furnished on request.

Type TSS-16 code flashing switch consists of an induction-disc motor driving a cam shaft through a train of spur gearing. The cam, which is made to order for the code required, tilts a mercury tube to open and close the circuit. This flasher can be furnished for operating any two-letter code and some combinations of more than two letters. The tube has a capacity of 2000 watts. A radio interference suppressor is furnished as standard equipment.

Description			For 200-Watt Lamps	For 500-Watt Lamps
			Cat. No.	
FCB-12 Beacons	Clear (No Color Screen)		42196C	41252C
	Red Color Screen		42197C	41257C
	Green Color Screen		42198C	41258C
TSS-16 Switches	Standard Flasher	110-Volt, 60-Cycle	46097	
	Code Flasher	110-Volt, 60-Cycle	45894	

Prices on application.
Catalog numbers do not include incandescent lamps.
For other voltages and frequencies, consult the Main Office of the Crouse-Hinds Company, Syracuse, New York.

CROUSE-HINDS

Types FCB-12 Beacons and TSS-16 Switches

For Flashing Code and Marking Obstructions

Type FCB-12 Beacons

Housing: Cast aluminum alloy. A hinged frame is provided between the upper and lower lens assemblies, allowing the beacon to be opened at the middle for relamping.

Optical System: Consists of three Fresnel lens units, arranged to give a definite beam through 360° horizontally, from the horizontal to the zenith. The lenses are of heat-resisting glass. Two separate lamps are used, one operating base up and one base down.

Lamp Receptacle: Mogul prefocus base (Cat. No. HL3251).

Wiring Connections: A boss on the side of the base is tapped for 1-inch conduit and a terminal block is furnished in the base. A four-foot length of two-conductor cable is furnished, entering the housing through a stuffing box.

Lamps: Two 500-watt, PS40-bulb, 115-volt; or 200-watt, PS30-bulb, 115-volt, Mogul prefocus base lamps.

Color Screens: Two required (Cat. Nos.—Red, HL5844; Green, HL5845).

Flasher: When used as an auxiliary code beacon at an airport, type FCB-12 can be flashed by means of a mercury tube flasher. The flasher can be mounted in the base of the rotating beacon, and controlled by means of a cam on the bottom of the beacon shaft, provided the code signal desired can be flashed in a period of 10 seconds for a 6 R.P.M. beacon, or 20 seconds for a 3 R.P.M. beacon. Most single letters and a few two-letter combinations can be flashed in 10 seconds. A separate code flasher (type TSS-16, listed on page 5 of this section) is recommended.

Finish: Aluminum.

Net Weight: 66 lbs.

Shipping Weight: 140 lbs.

Type TSS-16 Switches

Housing: Cast Feraloy, weatherproof.

Installation: Type TSS-16 switch must be installed in an approximately level position.

Bearings: All shafts of the type TSS-16 motor flashing switch rotate on jewel or radial and thrust ball bearings, which will operate for a long period of time without attention. It is recommended that these switches be oiled periodically. The Crouse-Hinds Company will furnish a satisfactory lubricant in small cans.

Speed of Flash: The standard flasher, used in operating type FCB-12 beacon for marking hazardous flying areas, where a definite code is not desired, is set for 40 flashes per minute: "On" period—one second; "off" period—½ second.

Net Weight: 27 lbs.

Shipping Weight: 40 lbs.

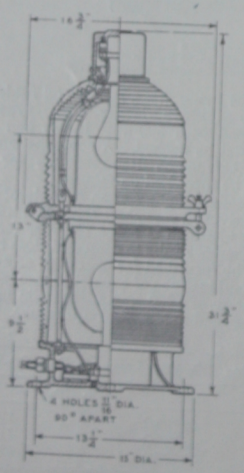


Fig. 5
Dimensions and Sectional View—Type FCB-12

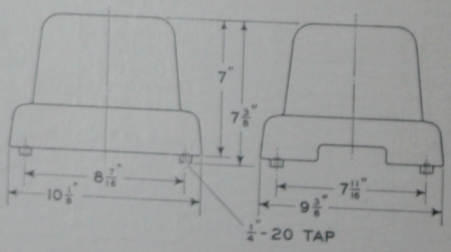


Fig. 6
Dimensions—Type TSS-16

301

Airport Beacons

302

Airport Floodlights

CROUSE-HINDS

Landing Field Illumination

Fig. 1
Landing Field Illumination
Syracuse Airport—Syracuse, New York

A properly floodlighted landing field not only increases the safety of night flying, but also gives increased confidence to passengers flying the airlines. The value to the aviation industry of this public confidence cannot be overestimated. Good lighting is good advertising.

The lighting system should also be designed to take care of the needs of inexperienced private pilots and of strange pilots landing at the airport for the first time. These conditions demand better lighting than might be required for the pilots who are familiar with the field and all of the landing conditions.

Floodlighting Requirements: Good practice and the requirements of the Department of Commerce require that the floodlighting system provide the following:

1. A sufficient number of floodlight locations to provide lighting for any landing direction without glare to the pilot;
2. For every landing direction the lighted area should be an ellipse at least 3000 feet long and 500 feet wide;
3. The minimum vertical illumination within the lighted area should be .2 foot candles; and
4. The floodlights should be so located that no sharp shadows appear on the landing area.

Type DCE-24 floodlights provide ideal lighting for any type of airport. They can be installed in groups of from two to fourteen units to light any size or shape of airport. The way in which the light pattern can be built up to fit any size or shape area efficiently is illustrated on page 2 of this section. Future requirements, where an airport is enlarged, are easily met by adding units and rearranging the distribution.

This system also allows an airport, whose funds are limited, to install a few floodlights at the start, and to gradually add to the installation until a first-class lighting job is obtained.

Reliability: The reliability of the lighting system is of vital importance to any airport. The burning out of one lamp in a group of type DCE-24 floodlights does not leave the field in darkness or seriously affect the lighting results.

Fields of Uneven Contour: They sometimes cannot be lighted completely from any one location. In such cases, type DCE-24 floodlights can be so located that two or more groups of units are lighted for any one landing direction in order to light the entire length of the landing strip.

Installation and Wiring: Complete information on the best methods of installing and wiring airport floodlights is given on pages 5 to 9 of this section.

303 Ceiling Projectors
304 Boundary Lights
305 Miscellaneous
306 Hangar Lighting And Wiring
307 Ac... And F...
308 Indexes Airport

Landing Field Illumination

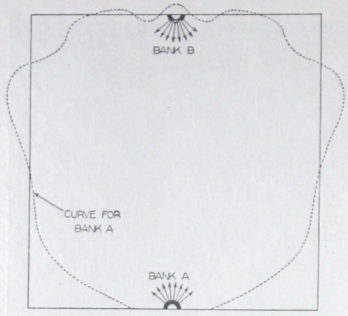


Fig. 2
An All-Way Field, 3000 Feet Square Lighted with Two Banks of Type DCE-24 Floodlights, each Located in the Centers of Opposite Sides of the Field

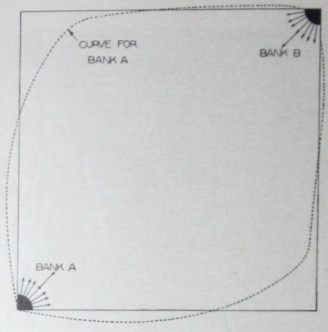


Fig. 3
An All-Way Field, 3000 Feet Square Lighted with Two Banks of Type DCE-24 Floodlights, each Located in Opposite Corners

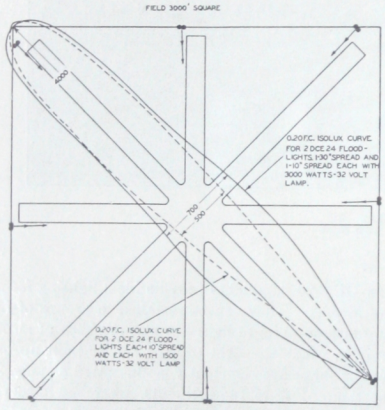


Fig. 4
A Runway Field Ideally Lighted with Two Type DCE-24 Floodlights, Located at each end of each Runway
(The curve shows the lighting of one runway only)

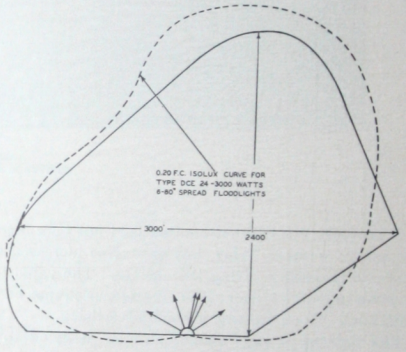


Fig. 5
Irregularly-Shaped Landing Field showing Isolux Curve and Candlepower Produced by a Bank of Type DCE-24 Field Floodlights
(The proper grouping of such units illuminates this irregular field without loss of light)

The four typical installations shown above illustrate the flexibility of Crouse-Hinds type DCE-24 landing field floodlights. The fields shown in Figs. 2 and 3 are completely lighted with no waste light, even though the installation in Fig. 2 requires a 180° spread, while the installation in Fig. 3 requires only a 90° spread.

Fig. 4 shows a field with hard surface runways. Such a field can be ideally lighted by the system shown. Each landing direction has its own lighting system with the floodlights located to give the best possible lighting. The wattage used at any one time is very small, resulting in low operating expense.

This installation is designed to light not only the runway itself, but an average area 500 feet wide. This allows landings to be made on either side of the runway if the runway should for any reason be blocked. The proper installation of the floodlights is shown on pages 5 and 6.

Fig. 5 shows an odd-shaped field and again illustrates the flexibility of the Crouse-Hinds type DCE-24 floodlight system, which is designed so that each installation gives just the shape light pattern required to fit the field, with no wasted light and no unlighted section.

Crouse-Hinds illuminating engineers will gladly plan the best lighting system for any type of field. The following information should accompany any request for this service:

1. A map of the airport showing contour lines of final grades at two-foot intervals;
2. The location, dimensions, and construction of all proposed and existing paved runways;
3. Night and day wind rises;
4. Location, extent, and height of all obstructions on the field or within a 1 to 15 slope through the boundary lights;
5. Voltage, frequency, and phase connections of power supply; and
6. Location of power supply and control room.

CROUSE-HINDS

Type DCE-24 Airport Floodlights

1500 or 3000-Watt

Fig. 1
Type DCE-24

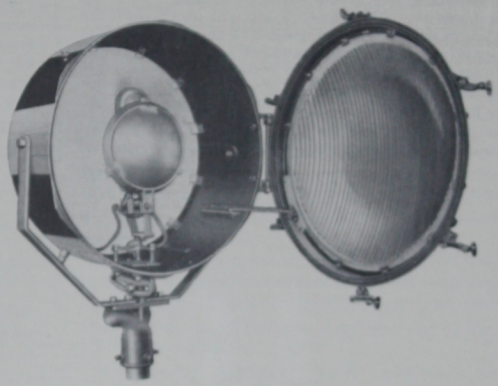


Fig. 2
Type DCE-24
With Door Open showing
Focusing Mechanism

Type DCE-24 airport floodlights are designed for the illumination of large landing fields. They can be used in banks of from three to fourteen units with the beams overlapped for the illumination of level fields, or in groups of two at each end of each runway for runway floodlighting.

Advantages of Type DCE-24 Floodlights: Type DCE-24 landing field floodlights offer the advantage of a unit system of lighting with a variable light pattern to fit any size or shape of field. The majority of fields cannot be lighted to the best advantage with any single lighting unit having a fixed distribution. The distribution from each of these units can be varied by means of different spread lenses. In addition to this, the beams of the various units making up each bank of floodlights can be overlapped to produce any shaped distribution or to fit any shape of field.

This unit system has also proven to be unusually safe and reliable. One lamp burning out does not leave the field in darkness.

Some fields are of such uneven contour that they cannot be lighted from one point. Type DCE-24 floodlights can be distributed either in single units or groups, so that the entire field will be uniformly lighted.

Focusing: A precision type of lighting unit, such as type DCE-24 floodlight, must be very accurately focused to obtain the greatest effective light output. Every DCE-24 floodlight is focused with extreme care in a Photometric Laboratory, where the beam is thrown on a screen over 100 feet from the floodlight in a dark room, and adjusted for maximum output. This factory setting is permanent. The Bipost receptacle requires no further adjustment when the floodlight is relamped.

Description		For 3000-Watt Lamps	For 1500-Watt Lamps
		Cat. No.	Cat. No.
DCE-24	With 10° Spread Lens	42482	42938
	With 30° Spread Lens	40775	42939
	With 80° Spread Lens	40783	42940

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Type DCE-24 Airport Floodlights

1500 or 3000-Watt

Housing: Cast aluminum alloy in one piece, dust-tight, non-ventilated, and weatherproof.

Reflectors: 25-inch, commercial precision mirrored glass. An auxiliary spherical reflector is provided in front of the lamp. This reflector intercepts the spill light that would otherwise be wasted and redirects it onto the main reflector. This adds considerably to the light output of the floodlight, and eliminates spill light which would otherwise be objectionable to a pilot in the air.

Mounting: Slip fitter for 2½-inch pipe, with a wire outlet consisting of a 2-wire cover with holes, 11/16 of an inch in diameter. The wires are brought up through the supporting pipe. See Fig. 4, page 6 of this section. The slip fitter is oval in shape and equipped with four set screws for leveling the floodlight after it is installed.

Lamp Receptacle: Mogul Bipost (Cat. No. KL577).

Door Frame: Cast aluminum alloy, hinged at side and clamped to housing with six "C" clamps; fitted with an asbestos gasket and provided with an arm which holds door in place while open.

Lens: 25-inch diameter, heat-resisting, spread lens, which gives a horizontal beam spread of approximately 10, 30, or 80°. See section 307, page 2.

Lamps: 1500-watt, 32-volt, T-24 bulb; 3000-watt, 32-volt, T-32 bulb; Bipost base. The lamp receptacle is focused accurately at the factory to both the main mirror and the spherical mirror. No further focusing is required when the floodlight is relamped.

Transformer Housings: The transformer housings, listed on page 5, can be installed as part of the floodlight support. See Fig. 4, page 6 of this section. They provide the simplest and neatest mounting.

Finish: Black enamel with chrome yellow stripes.

Net Weight: 122 lbs.

Shipping Weight: 245 lbs.

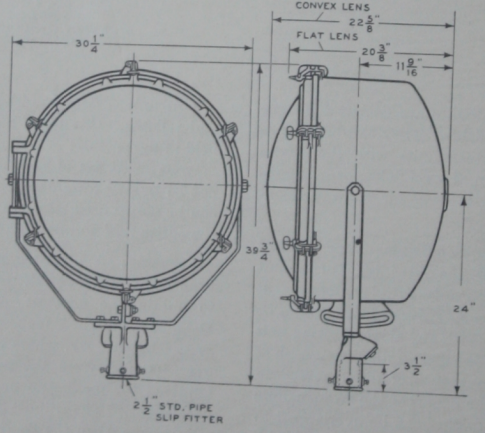


Fig. 3
Dimensions—Type DCE-24

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Installation and Wiring

Fig. 1
Transformer Housing

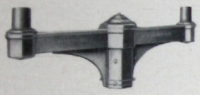


Fig. 2
Double-Bracket Arm

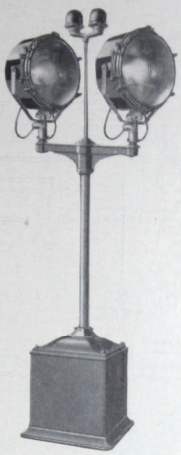


Fig. 3
Type DCE-24 with Transformer Housing and Obstruction Lights

Installation: Fig. 3 shows a neat and convenient method of installing two type DCE-24 floodlights, whether mounted alone or as part of a bank of units. On account of the high current and low voltage of the lamps, it is necessary that the transformer be located as close to the floodlights as possible. The transformer housing, as part of the floodlight support, offers a convenient method of doing this. The wiring is all enclosed in the supporting pipe and hollow double-bracket arm. Complete details and dimensions are given in Fig. 4, page 6.

Mounting Height: The mounting height of the floodlights will depend on the contour of the area to be lighted, and must be determined for each installation from the contour map. Crouse-Hinds engineers will specify the proper height for all installations made with type DCE-24 floodlights.

Wiring: The wiring method employed will depend somewhat upon the service available. For short runs, a 440-volt circuit can be run to each bank of floodlights. However, in most cases, the load and the distance will result in a 2300-volt service being more economical. The wiring diagram, Fig. 2, page 7 shows the connections and control.

Transformers should be provided with three or four primary taps to allow for voltage drop in the feeder.

Incandescent lamps are extremely sensitive to changes in voltage. All installations are calculated on the basis of exactly 32 volts being delivered to the socket of each lamp. This must be maintained within 1% for the most economical installation. A lamp operating 5% under its rated voltage loses 16% of its rated output. The charts, Figs. 3 and 4, page 7, give the wire size required for the feeder to the bank of floodlights. These charts allow a 5% voltage drop in the feeder, which can be compensated for by the transformer taps.

Each floodlight transformer should be separately fused.

Control: Each group of floodlights should be controlled by a remote control contactor with remote operating switch located in the airport operator's control room.

Obstruction Lights: It is important that the landing field floodlights be marked with obstruction lights. When two units are mounted in a group, they should be marked with a double unit. A group of units can be marked with one double obstruction light on each end group of two floodlights.

The installation shown in Figs. 3 and 4 on this and page 6 combines the obstruction light mounting with the floodlight support. The boundary light circuit, whether series or multiple, can be run into the standard and up to the obstruction lights.

Transformer Housings: These transformer housings consist of a cast Feraloy base and top, with sides of heavy 10-gauge steel. The anchor bolts, embedded in the concrete base, extend up through the corners and clamp the assembly together. The top of the housing is furnished with a threaded hub and socket for the 4-inch pipe standard. The transformers can be installed and wired before the top of the transformer housing is attached. After installation, access to the transformers can be made through the large opening in the side which is covered by a removable plate.

The height of the steel sides of the transformer housing can be varied as required. The standard height will fill most requirements, but any special height required can be furnished if specified.

Double-Bracket Arm: The double-bracket arm shown in Fig. 2 is designed to support two type DCE-24 floodlights. The slip fitter on the bottom fits over the 4-inch pipe support. The bracket arm is of cast Feraloy. It is hollow, and has a detachable plate in the center to simplify wiring. A ¾-inch threaded hub on the plate provides a convenient mounting for the obstruction lights.

	Description	Cat. No.
Transformers, Bracket Arm, and Obstruction Lights	Transformer Housing Only, Inside Height—30 Inches★	KL278
	Transformer Housing Only, Inside Height—36 Inches★	KL932
	Double-Bracket Arm Only	HL3123
	Double Obstruction Light, Series with Globes	42972
	Double Obstruction Light, Multiple with Globes	42970

Prices on application.
Catalog numbers do not include incandescent lamps.
★KL278 will accommodate most standard 2300 to 32-volt transformers up to 7½ K.V.A.
★KL932 will accommodate most standard 2300 to 32-volt transformers up to 10 K.V.A.

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Installation and Wiring

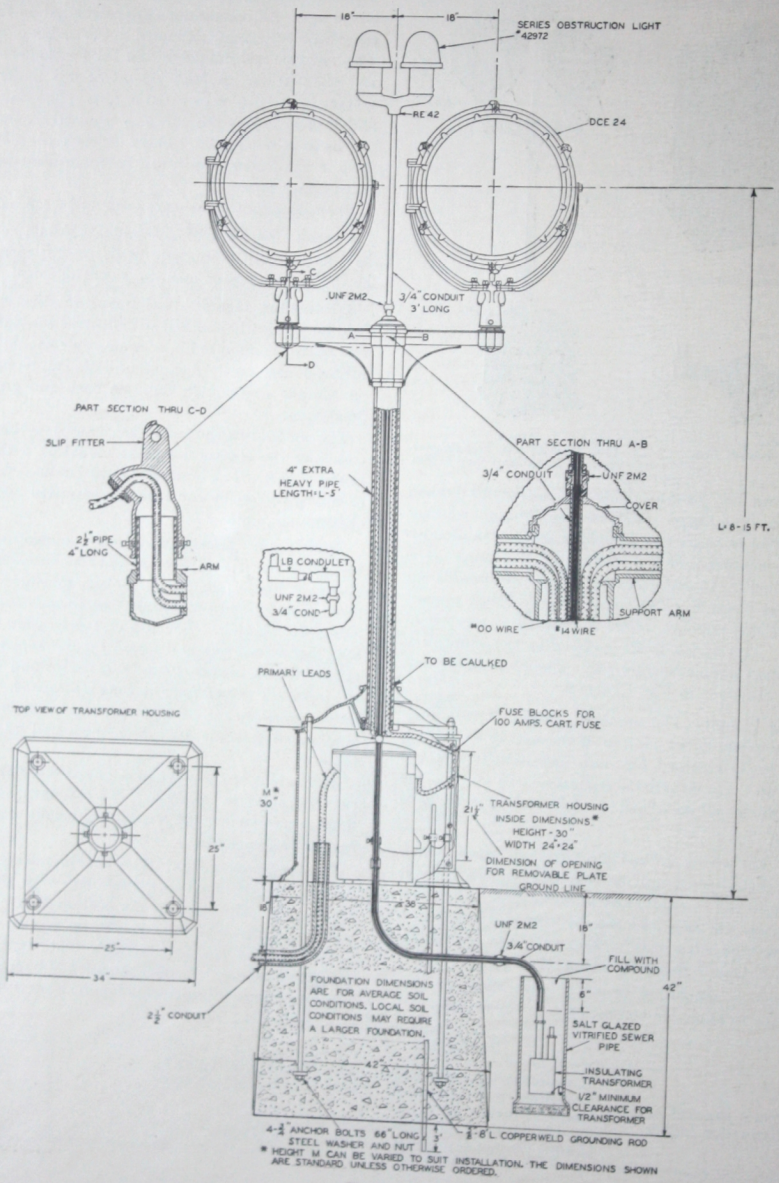
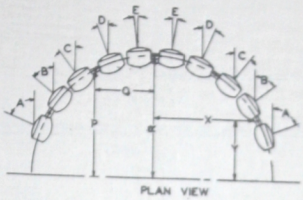


Fig. 4
Installation Details of Two Type DCE-24 Floodlights with Series Obstruction Lights Mounted on Double-Bracket Arm and Transformer Housing
Multiple Obstruction Lights can be used if a Multiple Circuit is available

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Installation Details



PLAN VIEW

FIG. 1

DISTANCES FOR CONCRETE FORMS
X = 7'-9" Q = 4'-6" R = 9'
Y = 4'-6" P = 7'-9"

ANGULAR SETTINGS
A = 60° C = 30° E = 5°
B = 35° D = 17.5°

THESE LOCATIONS ARE TYPICAL FOR A BANK OF 10-DCE 24 PLACED ON A 9' RADIUS AT MID-POINT OF A FIELD 3000' SQUARE.

LOCATIONS FOR OTHER SIZE FIELDS WILL BE FURNISHED ON REQUEST

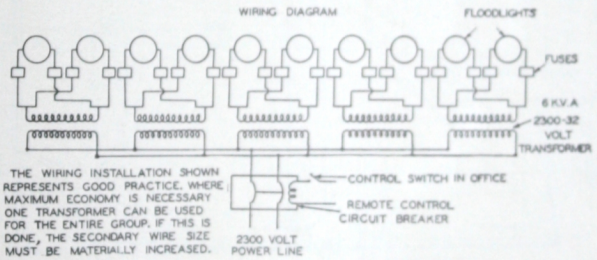


FIG. 2

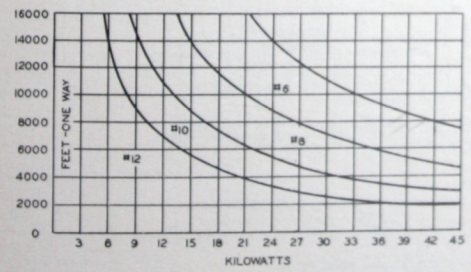


FIG. 3
WIRE SIZE CHART FOR 2300 VOLT PRIMARY

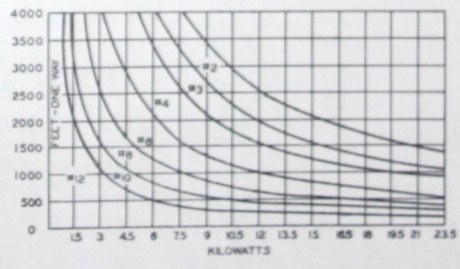


FIG. 4
WIRE SIZE CHART FOR 440 VOLT PRIMARY

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Installation and Wiring Details for Runway Floodlighting

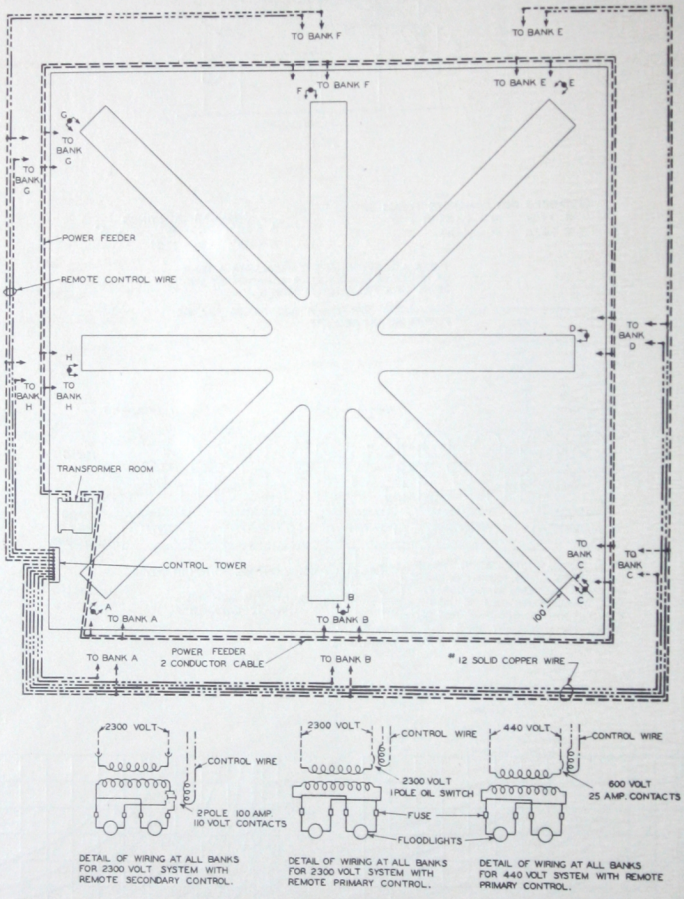
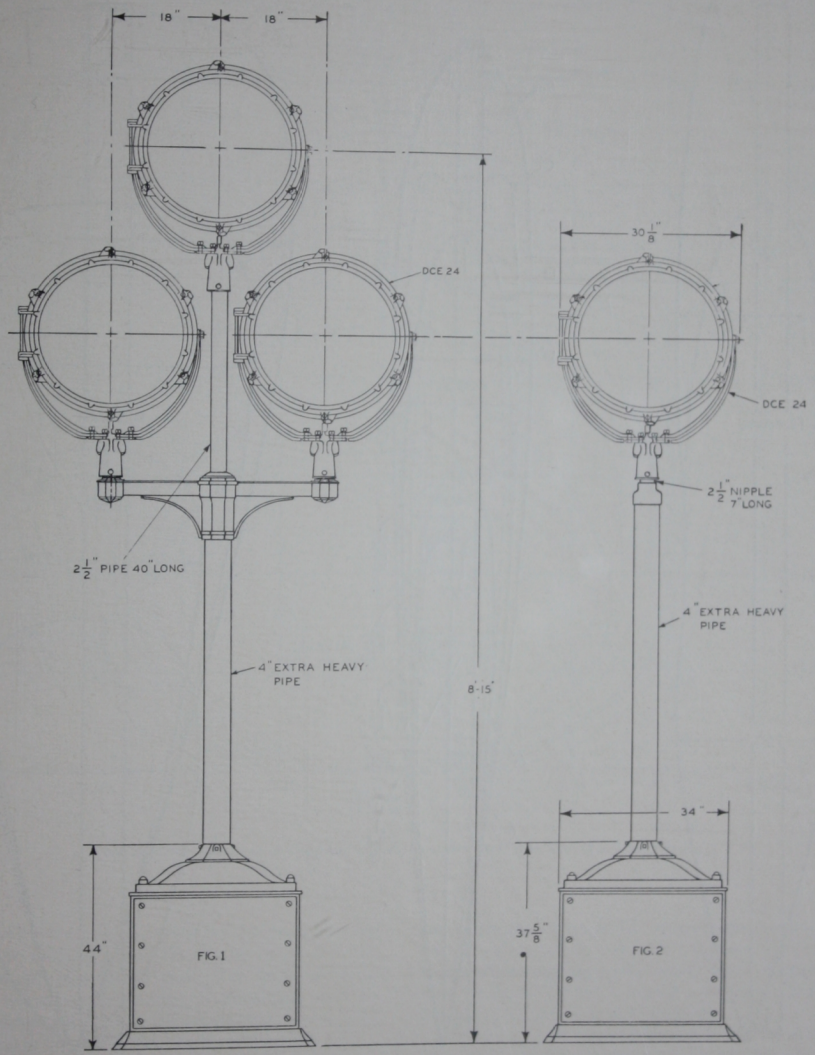


Fig. 5
Installation and Wiring Details of Type DCE-24 Floodlights for Runway Floodlighting

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Installation Details



Installation Details of One and Three Type DCE-24 Floodlights
Fig. 1 uses KL932 Transformer Housing; Fig. 2 uses KL278 Transformer Housing

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Isolux Curves for Runway Floodlighting

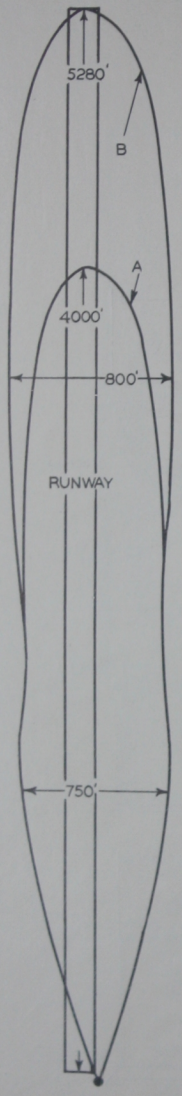


Fig. 3
.2 F. C. Isolux Curves
Type DCE-24 with 3000-Watt Lamp
A—1—10° Spread Lens Unit
1—30° Spread Lens Unit
B—2—10° Spread Lens Units
1—30° Spread Lens Unit

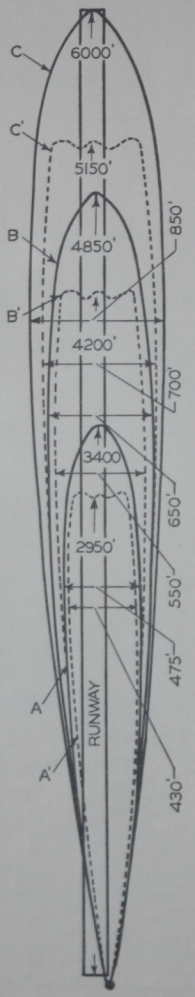


Fig. 4
.2 F. C. Isolux Curves
Type DCE-24 with 10° Spread Lens
A —1 Unit, 3000-Watt Lamp
A'—1 Unit, 1500-Watt Lamp
B —2 Units, 3000-Watt Lamps
B'—2 Units, 1500-Watt Lamps
C —3 Units, 3000-Watt Lamps
C'—3 Units, 1500-Watt Lamps

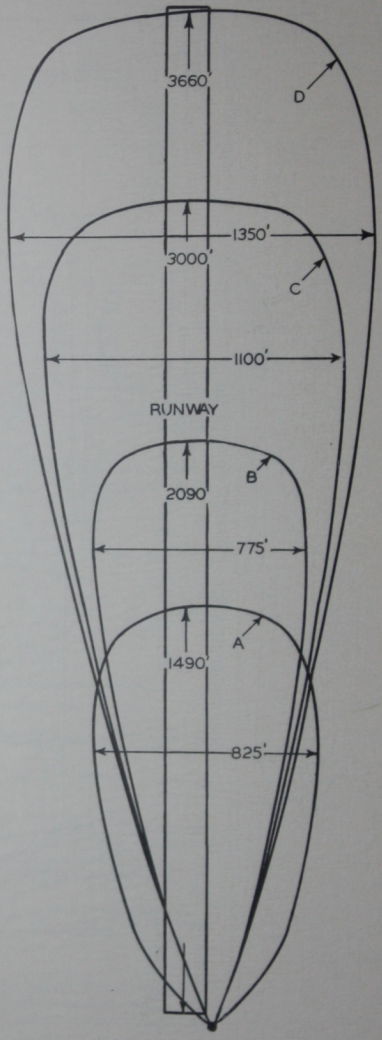


Fig. 5
.2 F. C. Isolux Curves
Type DCE-24 with 3000-Watt Lamp
A—1—80° Spread Lens Unit
B—1—30° Spread Lens Unit
C—2—30° Spread Lens Units
D—3—30° Spread Lens Units

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Isolux Curves

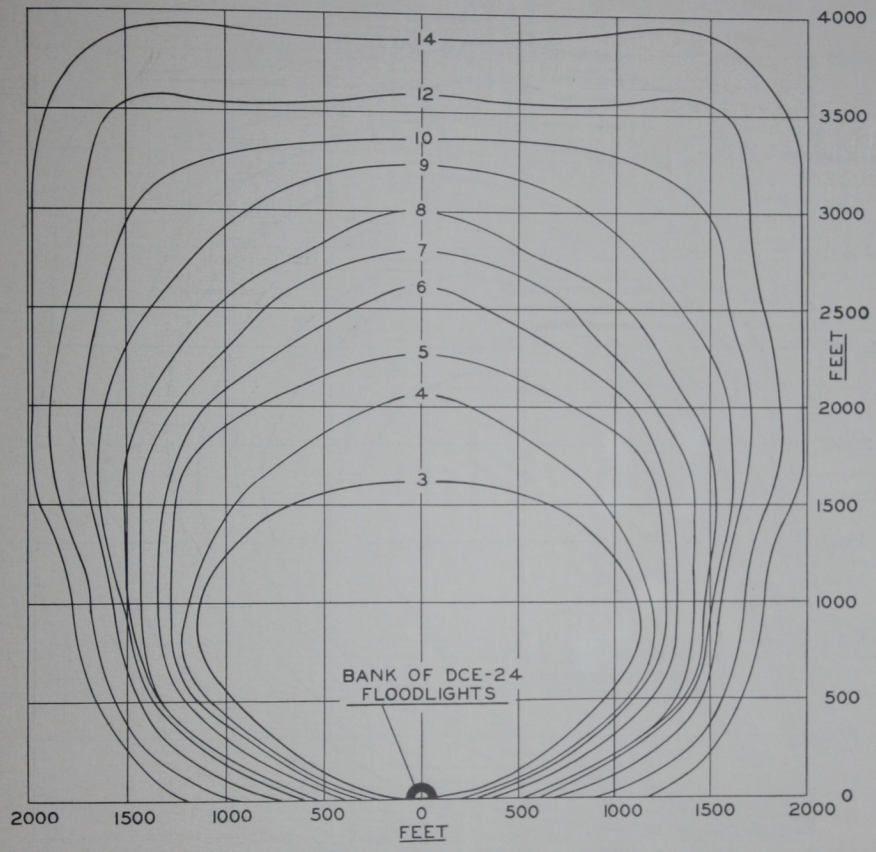


Fig. 1
Isolux Curves for Bank of Floodlights Mounted in Center of One Side of a Square Area

Fig. 1 shows typical isolux curves for .2 foot candles for groups of type DCE-24 airport floodlights mounted in the center of one side of a square area. The figures given in the curves represent the number of floodlights used to obtain the curves, each with a 3000-watt lamp. From this, the approximate number of floodlights required to light a square area can be determined. The floodlights can be adjusted to light an irregularly-shaped area or a square area from any other position. Curves for units mounted in the corner are given on page 12. These curves assume that the area is sufficiently flat to permit lighting from one point. Crouse-Hinds engineers will furnish curves for lighting any area. Layouts for fields having a rolling contour will be furnished, if contour map is supplied.

The above chart can be furnished to a scale of 200′ = 1″. This can be used to trace curves directly onto a tracing of an airport.

CROUSE-HINDS

Type DCE-24 Airport Floodlights

Isolux Curves

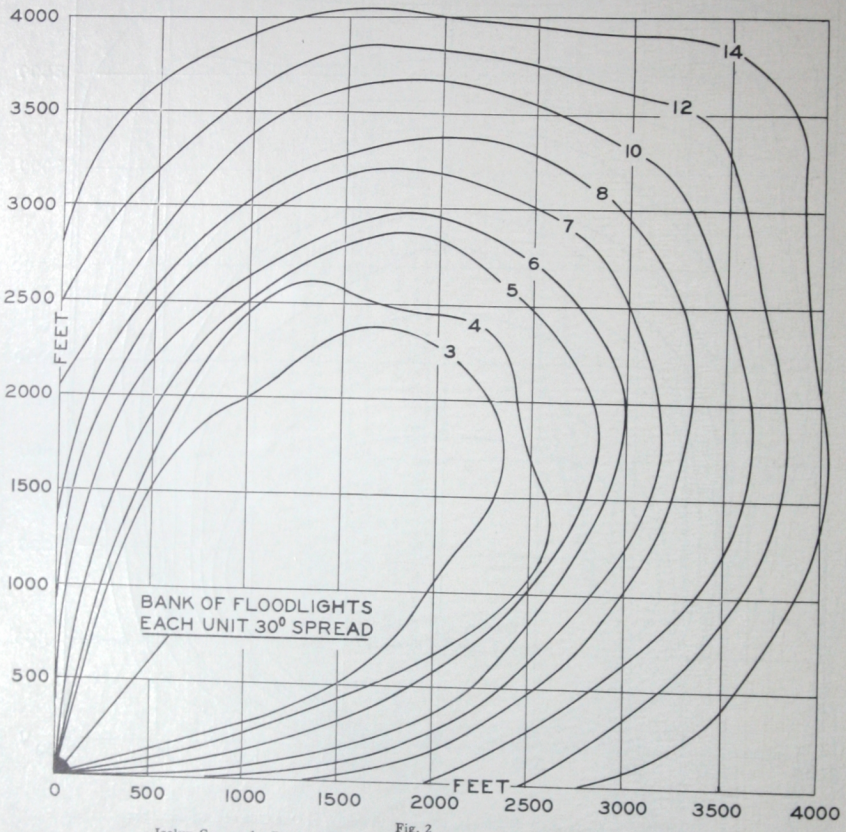


Fig. 2
Isolux Curves for Bank of Floodlights Mounted in One Corner of a Square Area

Fig. 2 shows typical isolux curves for .2 foot candles for groups of type DCE-24 airport floodlights mounted in one corner of a square area. The figures given in the curves represent the number of floodlights used to obtain the curves, each with a 3000-watt lamp. These curves assume that the area is sufficiently flat to permit lighting from one point. Crouse-Hinds engineers will furnish curves for lighting any area. Layouts for fields having a rolling contour will be furnished, if contour map is supplied.

The above chart can be furnished to a scale of 200′ = 1″. This can be used to trace curves directly onto a tracing of an airport.

CROUSE-HINDS

Type DCE-16 Ceiling Projectors and Ceiling Height Indicator

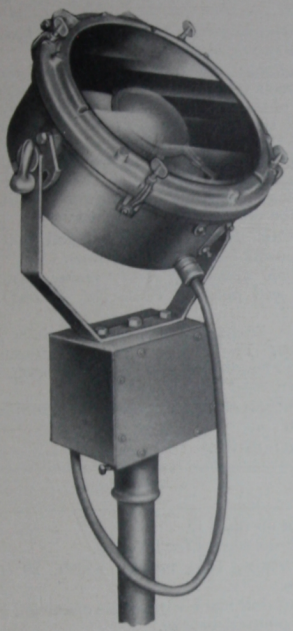


Fig. 1
Type DCE-16
With Transformer Housing
and Slip Fitter

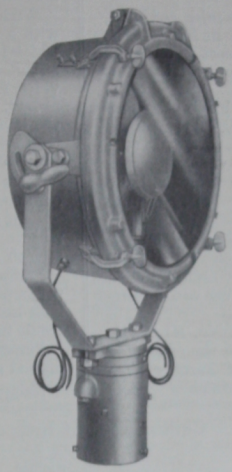


Fig. 2
Type DCE-16
With Slip Fitter

Fig. 3
Ceiling Height Indicator

Every airport should be equipped with a type DCE-16 ceiling projector and a ceiling height indicator, by means of which the "ceiling" or height of the clouds above the ground may be accurately measured. The ceiling projector is merely a powerful searchlight, the beam of which is pointed upward to the clouds; and the ceiling height indicator is a quadrant, graduated directly in feet.

There are two methods by which the "ceiling" may be determined when using the type DCE ceiling projector. The original method was to install the ceiling projector at some convenient point and direct the beam upward at an angle of 45°. The height of the clouds could then be determined by pacing the distance from the projector to a point directly under the light spot which appeared on the clouds. The second method of measuring the height of the "ceiling" is by the use of the ceiling height indicator in connection with the projector. With the ceiling height indicator, it is merely necessary for the operator to throw a switch which controls the ceiling projector and sight along the pointer of the ceiling height indicator to determine the height directly in feet. The ceiling height indicator may be located just outside of the Administration Building.

The ceiling height indicator is especially valuable where weather conditions are requested over the telephone, or at any time when immediate information is required.

A suitable switch may be mounted near the ceiling height indicator and an underground cable run to the ceiling projector which is 500 feet away. The beam of the ceiling projector should be elevated at an angle of 63° 26′.

On page 3 of this section is a suggested method of installing the two pieces of apparatus, with the pipe standards mounted on concrete bases. The alternate installation shown uses the ornamental base listed below.

The indicator can be mounted in the control tower, and the projector on the roof of a hangar or other building at the same elevation. In this case, the projector can be furnished with a flat base.

Description†		Cat. No.
DCE-16 Projectors	With Transformer and Slip Fitter	42099
	Without Transformer	42100
	Canvas Cover Only	KL845
	Ornamental Base Only, with Transformer	43096
Ceiling Height Indicator	With 4-Inch Screw Fitter	40539
	Canvas Cover Only	HL5605

Prices on application.
Catalog numbers do not include incandescent lamps.
†Other types of bases will be furnished. See "Mountings," page 2.

CROUSE-HINDS

Type DCE-16 Ceiling Projectors and Ceiling Height Indicator

Type DCE-16 Ceiling Projectors

Housing: Cast aluminum alloy, dust-tight, non-ventilated, and weatherproof.

Reflectors: 16-inch, commercial precision mirrored glass. An auxiliary spherical reflector is mounted in front of the lamp, to intercept the spill light and redirect it onto the main reflector. This increases the efficiency of the unit considerably.

Mountings: 4-inch slip fitter. A 2½-inch slip fitter or a flange base for mounting on a flat surface can be furnished without additional charge, if specified on the order. Trunnion arms are of steel; bases, of cast Feraloy.

Focusing: Projectors are equipped with prefocus lamp receptacles and are focused at the factory. They require no further adjustments.

Quadrant: A graduated quadrant is provided on the side of the case, so that the beam may be elevated to desired angle. It is graduated for 45°, 63° 26′, and 90°.

Canvas Cover: A waterproof canvas cover can be furnished. See listing on page 1.

Lamp Receptacle: Mogul prefocus (Cat. No. HL3251). Other types can be furnished, if specified on the order.

Ornamental Base: An ornamental cast Feraloy base with top tapped for 4-inch pipe can be furnished. It is listed on page 1, complete with transformer. A large hand hole with cover is provided in the side.

Wiring Connections: The projector is listed complete with a 115 to 12-volt transformer mounted in a steel box, which forms part of the floodlight support. The secondary circuit is wired at the factory, and primary taps are provided at 110 and 105 volts; other special taps can be furnished. The primary circuit can be brought up through the supporting pipe into an opening in the bottom of the transformer housing. Secondary wiring for the alternate installation must be done by the contractor.

Door Frame: Cast aluminum alloy, hinged at top and clamped to the housing by four "C" clamps.

Lens: 16 7/16-inch diameter, clear, plain, flat, heat-resisting, ground and polished (Cat. No. KL883). See section 307, page 2.

Lamp: 420-watt, 35-ampere, 12-volt, G25-bulb, Mogul prefocus base lamp. The 420-watt lamp is recommended because of the high candlepower and narrow beam, which result in its concentrated low voltage filament.

Finish: Case, natural aluminum; base and trunnion, hot-dipped galvanized.

Shipping Weight: 97 lbs.

Ceiling Height Indicator

Frame: Cast bronze.

Segment: Cast bronze, calibrated to a high degree of accuracy.

Pointer: Cast bronze, with notched rear sight and pointed front sight. It is equipped with a wing nut for locking in definite position.

Mounting: Standard 4-inch brass pipe cap.

Canvas Cover: A waterproof canvas cover can be furnished. See listing on page 1.

Adjustments: Four screws for leveling.

Dimensions: Height, 15½ inches; width, 20 inches; depth, 12½ inches.

Finish: Segment, dull black with white enameled graduations; frame and pointer, bronze.

Net Weight: 33 lbs.

Shipping Weight: 55 lbs.

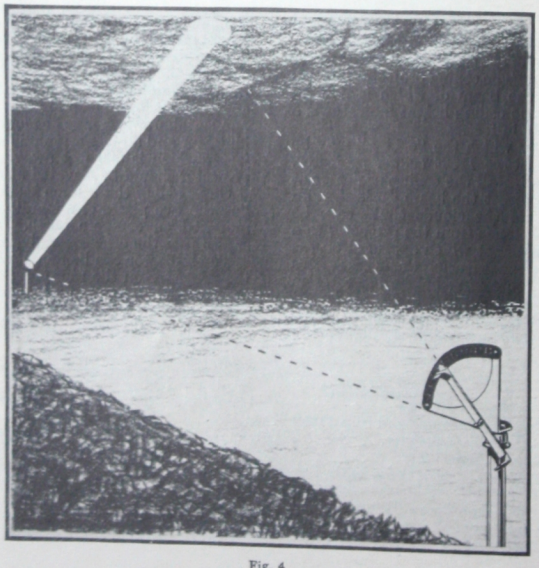


Fig. 4
Method of Determining Height of Clouds by using Type DCE-16 Ceiling Projector and the Ceiling Height Indicator

CROUSE-HINDS

Type DCE-16 Ceiling Projectors and Ceiling Height Indicator

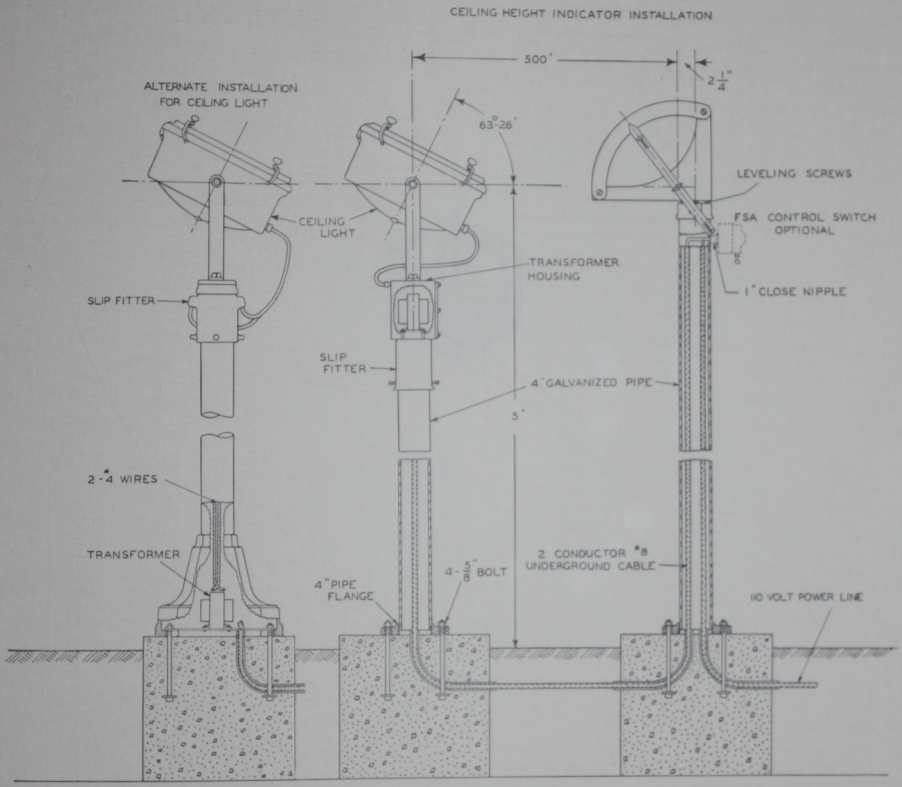


Fig. 1
Installation Details of Type DCE-16
Ceiling Projectors and Ceiling Height Indicator

Lengths of 4-Inch Pipe Required	
For Ceiling Projector with Pipe Flange Base	3 Ft.
For Ceiling Projector with Ornamental Base	2 Ft. 4 In.
For Ceiling Height Indicator	4 Ft. 7 In.

CROUSE-HINDS

Boundary, Obstruction, and Range Lights

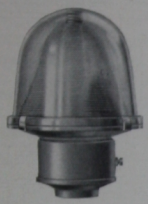


Fig. 1
Type VAW
Multiple Unit
Boundary Light

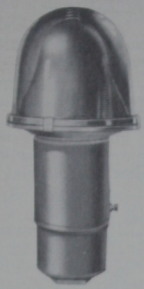


Fig. 2
Type VAW
Series Unit
Boundary Light

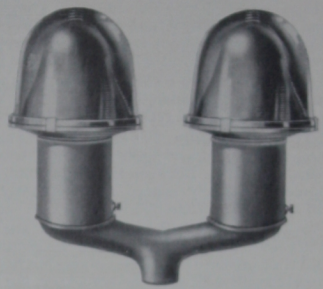


Fig. 3
Type VAW
Double Series Unit
Obstruction Light

Fig. 4
Type APB
Disconnecting Boundary Light

Fig. 5
Type APD
Flush Type Boundary Light

Fig. 6
Type CPD
Contact Light

The Crouse-Hinds Company manufactures a complete line of boundary, obstruction, contact, and range lights of all types. The units shown above are equipped with prismatic globes and meet the latest regulations of the Department of Commerce. Boundary lights with plain globes, to match existing installations of that type, can be furnished and are listed on pages 7 and 8 of this section.

Prismatic globes are recommended for new installations, as they provide higher candlepower within the useful angle, and permit the use of smaller lamps.

CROUSE-HINDS

Boundary, Obstruction, and Range Lights

Installation Requirements★

Boundary Light Circuits: Boundary lights can be operated from either series or multiple circuits, and the selection of the type of circuit to be used usually depends on the size of the field. The series system is generally considered more economical when the boundary light perimeter of the field is more than 12,000 feet. The multiple system is more economical for smaller fields, and should be used if the field maintenance personnel is not familiar with series circuits, which operate at higher voltages than multiple circuits.

Cable Sizes: For Series Circuits—No. 8 AWG single conductor underground cable, insulated for the maximum open circuit voltage of the transformer to be used.

Boundary Light Spacing: The entire landing area should be outlined with boundary lights—a unit placed at each angle in the boundary. Between the angle units, boundary lights should be equally spaced approximately 300 feet apart, and never more than 330 feet.

Location and Height: Boundary lights are normally mounted approximately 2½ feet above the ground. In no case should they be more than 5 feet above the field. Whenever a fence is located close to the boundary, the boundary light units should be located at least 10 feet inside the fence.

Range Lights (Formerly called Approach Lights): Green range lights should be used to mark the ends of runways, and should be installed in sets to codify the runways numerically. The greatest number of lights should be used on the best runway, and the units in each group should be 50 feet apart. Where two runways converge at the boundary line, the two groups of range lights must be separated from each other by at least one clear boundary light, even though short spacing is necessary.

Obstruction Lights: Red obstruction lights should replace clear boundary lights where the approach is particularly hazardous.

Lamps: For Series Boundary Lights—Clear, 320-lumen, S24½-bulb series lamps. Red or green, 1000-lumen, S24½-bulb series lamps.

For Multiple Boundary Lights—Clear, 15-watt, A-17 lamp with **clear bulb.** Red or green, 60-watt, A21-bulb clear traffic signal lamp.

Installation: Series Boundary Lights—Series boundary lights should be of the disconnecting turn-over type. Type APB disconnecting boundary lights are listed and the details of installation given on page 4 of this section.

Multiple Boundary Lights—Multiple boundary lights are usually rigidly installed, although disconnecting type units are available and are recommended as well worth the small additional cost. They must be equipped with cone, and mounted on a 1¼-inch pipe support as shown in Figs. 7 and 8, page 6 of this section.

Obstruction Lights at Airports†

Where Required: All obstructions on or near the airport that extend above a slope of 1 in 15, taken through any point on the edge of the landing area, must be marked with red obstruction lights. Obstructions are divided into two classes: narrow and extended.

Narrow Obstructions: Narrow obstructions include radio towers, transmission line towers, chimneys, and flag poles, and they should be marked as follows:

1. At the top one double obstruction light (Type VAW, Cat. No. 42970) should be installed. Both lamps can be burned simultaneously or a relay installed, so that when the operating lamp burns out, the spare lamp will be automatically lighted. HL5556 relay box is listed on page 6 of this section and if this method is used, it is strongly recommended that an indicating light be located at some convenient point where it will be observed, to indicate lamp failure. HL5555 indicating light is listed on page 6 of this section.

2. Two single obstruction lights (Type VAW, Cat. No. 42969) should be installed on diagonally opposite corners at the lower limit of the area protected by obstruction lights. This level shall not be above the 15 to 1 slope to the edge of the field, nor more than one-third the height of the obstruction above the general level of surrounding buildings, on obstructions more than 100 feet in height.

3. If the top and bottom obstruction lights are more than 70 feet apart, two additional single obstruction lights (Type VAW, Cat. No. 42969) should be located on diagonally opposite corners halfway between them. On very high obstructions, additional sets of two obstruction lights each must be installed so that the vertical spacing does not exceed 100 feet. The lights on the different levels should be located on staggered diagonals, so as to show the width of the structure from all directions.

Extended Obstructions: Extended obstructions such as buildings, gas tanks, bridges, grain elevators, pole lines, and groups of trees must be marked with obstruction lights to show their apparent contour as follows:

1. Single obstruction lights (Type VAW, Cat. No. 42969) should be located so as to mark the contour of the top. The lights should be located 150 feet apart and never more than 300 feet. These lights must mark the highest points of the obstruction, and so arranged that a sufficient number will be visible from all directions of approach to give an adequate indication of the extent of the obstruction.

2. If the height of the obstruction extends more than 70 feet above the 15 to 1 slope to the edge of the field, additional lights should be used to mark the principal vertical contours, and located as specified for narrow obstructions.

3. Double obstruction lights (Type VAW, Cat. No. 42970) should be located at the ends of a row of obstructions or at any corner or angle in an extended obstruction.

Obstruction Light Circuits: Multiple circuits should be used for obstruction lights except when they are connected to the boundary light circuit, when they should be connected through a series-to-series transformer, and series units used. A single obstruction light can be operated from the series boundary light circuit, through a series-to-multiple transformer. Series obstruction lights are listed on page 4, and multiple, on page 6 of this section. Obstruction lights should be installed on separate branch circuits wherever possible.

Lamps: For Series Obstruction Lights—Clear, 1000-lumen, S24½-bulb series lamp. In cases where there are not many competing lights and visibility is good, the 600-lumen series lamp may be used on obstructions less than 100 feet in height.

For Multiple Obstruction Lights—Clear, 60-watt, 67-watt, or 100-watt, A21-bulb traffic signal lamps. 60-watt lamps are for units mounted below 100 feet; 100-watt lamps, for units mounted more than 100 feet above the ground. The 67-watt lamp has the same light output as the 60-watt, but a life of 3000 hours. It is recommended for units which are difficult to relamp. These three lamps have the same light center length and are interchangeable in the fixtures.

★The information on installation requirements given on this page is taken from the "Standard Specifications for the Installation of Airport Lighting Equipment," issued by the Bureau of Air Commerce, Airport Section, dated December 1, 1936.

†The marking of high obstructions along airways is subject to special regulations. Information will be furnished on request.

CROUSE-HINDS

Types VAW and APB Boundary, Obstruction, and Range Lights

For Series Circuits

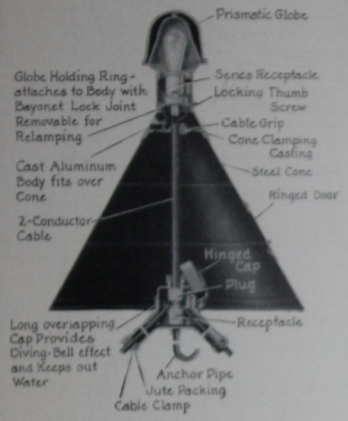


Fig. 1
Type APB
Disconnecting Boundary Light
For Series Circuits—Sectional View

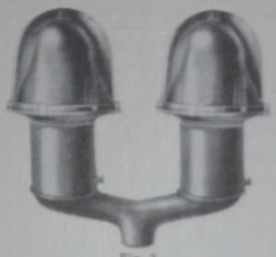


Fig. 2
Type VAW
Obstruction Light
Double Unit

Fig. 3
Type VAW Obstruction Light
Single Unit
Sectional View showing
Ease of Wiring and Relamping

Fig. 4
Disconnecting Cutout
Plug and Receptacle

Fig. 5
Cone for
Series Boundary Lights

Boundary, Obstruction, and Range Lights

Housing: Cast aluminum, with hub tapped for 1¼-inch conduit.

Body is made in two pieces as shown in Fig. 3. The two parts of the cast housing can be quickly separated by loosening one thumb screw, leaving the socket readily accessible for wiring, and making relamping more convenient. It is not necessary to unscrew the globe to relamp. Type APB bodies are shaped to fit over the cone top, and they are furnished with a strain relief cable grip.

Globes: Prismatic. Meet Department of Commerce Performance Specifications for boundary, obstruction, and range light use.

Gasket: A rubber gasket is provided where the globe seats in the housing (Cat. No. Gask393).

Lamp Receptacle: Series spring clip receptacle (Cat. No. KL890).

Lamps: For Clear Globes—320-lumen, S24½-bulb series lamp.

For Red or Green Globes—1000-lumen, S24½-bulb series lamp.

Film Cutouts: Film cutouts are not furnished with lighting units. Film cutouts of the proper voltage rating for the circuit involved, should be obtained.

Obstruction Light Fixtures: Obstruction light sockets must be adjusted or focused for the height at which they are mounted. All type VAW units are furnished with an adjustable socket support having three positions, marked "Bound, Under 50 Feet"; "50 to 100 Feet"; and "Over 100 Feet." When the unit is wired, the socket is set in one of these three positions, which focuses the main beam of the unit at the most effective angle for that mounting height.

Cones

Material: Lead-coated, sheet steel.

Painting: Cones are painted with chrome yellow and black striping in accordance with Department of Commerce specifications. The stripes run horizontally on boundary light cones, and vertically on range light cones.

Door: A door is provided in the side of the cone for access to the plug and receptacle.

Cone Caps: Type APB boundary lights are made with a cone cap cast as part of the body. A cast ring on the inside of the cone clamps the cone solidly to the body, making a neat and watertight connection. Cones with a separate cap and 1¼-inch pipe nipple on top can be furnished.

Disconnecting Cutout Plug and Receptacle

Receptacle Housing: Cast Feraloy, hot-dipped galvanized. A compound well is provided on the bottom, blind tapped for ½-inch pipe, which serves as an anchor. No concrete base is required.

Cover: Cast Feraloy, equipped with spring door to close opening when plug is removed.

Receptacle: A spring-clip type of receptacle, which automatically reestablishes the series circuit when the plug is withdrawn.

Plug: A series plug with cast Feraloy cap and watertight cable grip.

Connecting Cable: Flexible two-conductor cable attached to plug and of sufficient length to attach to boundary light receptacle terminals.

Cable Entrances: The receptacle housing is provided with two cable entrances for the underground cable. They are equipped with strain relief clamps. After installation, the cable entrances are sealed with compound.

CROUSE-HINDS

Types VAW and APB Boundary, Obstruction, and Range Lights

For Series Circuits

Description (Fig. Nos. below refer to page 3 of this section)			Cat. No.
APB	Series Disconnecting Boundary Light Complete with Globe, Cone, and Cutout		42733
	Series Disconnecting Obstruction Light Complete with Globe, Cone, and Cutout		42735
	Series Disconnecting Range Light Complete with Globe, Cone, and Cutout		42734
VAW	Boundary Light with Globe (Fig. 3)		42985
	Single Obstruction Light with Globe (Fig. 3)		42971
	Range Light with Globe (Fig. 3)		42986
	Double Obstruction Light with Globes (Fig. 2)		42972
	Single Body for Boundary, Obstruction, or Range Light Complete without Globe		42963
Accessories	Cones	For Boundary Lights	KL1122•
		For Obstruction Lights	KL1124•
		For Range Lights	KL1123•
	Globes	For Boundary Lights (Fig. 5)	KL846•
		For Obstruction Lights	KL848•
		For Range Lights	KL847•
	Disconnecting Cutout Plug and Receptacle with Cable (Fig. 4)		42750

Prices on application.
Catalog numbers do not include incandescent lamps.
•Denotes change in catalog number.

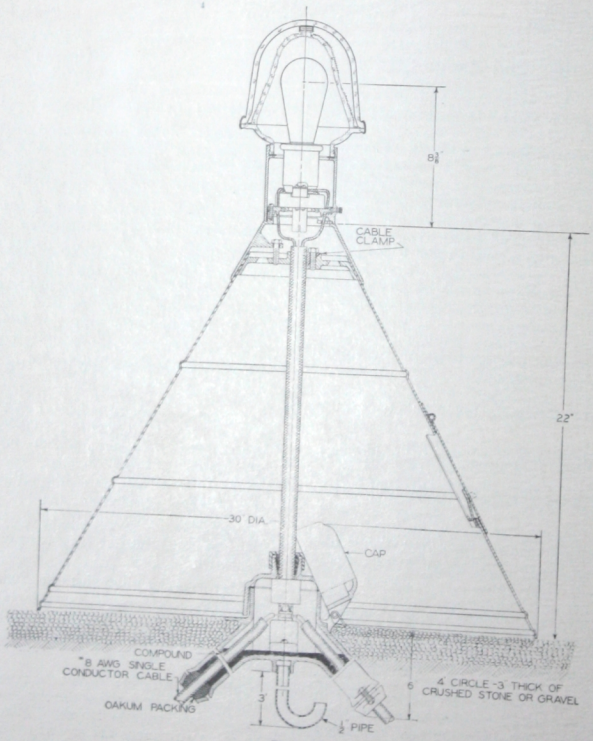


Fig. 6
Installation Details of APB Series Boundary Light

CROUSE-HINDS

Types VAW and APB Boundary, Obstruction, and Range Lights

For Multiple Circuits

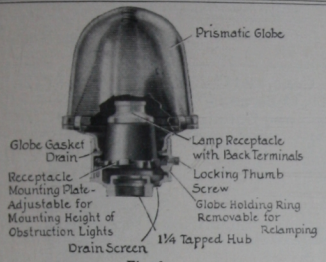


Fig. 1
Type VAW Boundary Light
Single Unit

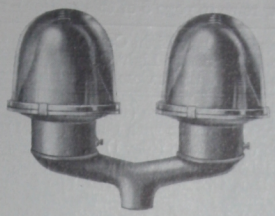


Fig. 2
Type VAW Obstruction Light
Double Unit

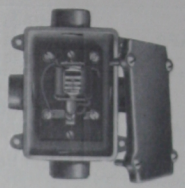


Fig. 3
Relay Box for
Double Obstruction Light

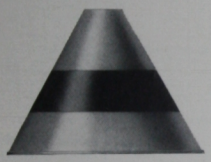


Fig. 4
Cone for
Multiple Boundary Light

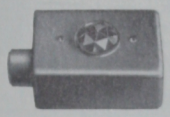


Fig. 5
Indicating Light

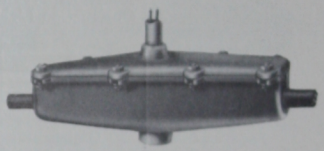


Fig. 6
Junction Box
For Boundary Lights

Boundary, Obstruction, and Range Lights

Housing: Cast aluminum, with hub tapped for 1¼-inch conduit. Body is made in two pieces as shown in Fig. 1. The two parts of the cast housing can be quickly separated by loosening one thumb screw, leaving the socket readily accessible for wiring; and making relamping more convenient. It is not necessary to unscrew the globe to relamp. Type APB bodies are shaped to fit over the cone top, and they are furnished with a strain relief cable grip.

Globes: Prismatic. Meet Department of Commerce Performance Specifications for boundary, obstruction, and range light use.

Gasket: A rubber gasket is provided where the globe seats in the housing (Cat. No. Gask393).

Lamp Receptacle: Porcelain medium screw base (Cat. No. KL877).

Lamps: For Boundary Lights—Clear, 15-watt, A17-bulb lamps.

For Range or Obstruction Lights mounted below 100 feet—Clear, 60-watt, A21-bulb traffic signal lamps.

For Obstruction Lights mounted more than 100 feet above ground—Clear, 100-watt, A21-bulb traffic signal lamps.

Obstruction Light Fixtures: Obstruction light sockets must be adjusted or focused for the height at which they are mounted. All type VAW units are furnished with an adjustable socket support with three positions. When the unit is wired, the socket is set in one of these three positions, which focuses the main beam of the unit at the most effective angle for that mounting height.

Cones

Material: Lead-coated, sheet steel.

Painting: Cones are painted with chrome yellow and black striping in accordance with Department of Commerce specifications. The stripes run horizontally on boundary light cones, and vertically on range light cones.

Cone Caps: Type APB boundary lights are made with a cone cap cast as part of the body. A cast ring on the inside of the cone clamps the cone solidly to the body, making a neat and watertight connection. Cones with a separate cap and 1¼-inch pipe nipple on top can be furnished.

Cone Braces: Three braces are furnished, arranged to attach to the cone at the bottom and to a collar which fits around the 1¼-inch pipe support.

Junction Boxes

Type UGA junction boxes make a very convenient installation. The cover of the box is at ground level, and in the event of a collision, the supporting pipe will usually break at the point where it is screwed into the cover of the box. It is a simple matter to remove the cover of the box, attach new wires to the terminal block and replace the boundary light. See Fig. 7, page 6. Type UGA junction boxes are listed in section 305, pages 3 and 4.

Disconnecting Cutout Plug and Receptacle

Type APB disconnecting multiple boundary lights are similar to the series disconnecting units listed on page 4, except they have a multiple plug and receptacle and multiple lamp receptacle.

Relay Box

Housing: Cast Feraloy, cadmium-galvanized. The cover is attached to the body by four screws, and is made watertight by a gasket.

Hubs: Four tapped hubs are provided—top and bottom hubs, 1¼ inch; side hubs, ¾ inch. Side hubs are furnished with pipe plugs.

Relay: The relay is a series type, designed to complete the circuit to the spare lamp upon failure of the operating lamp. It is strongly recommended that an indicating light be installed at some convenient point to indicate when the operating lamp has failed. The relay listed will operate with either a 60 or a 100-watt lamp; relays for other lamps can be furnished.

Indicating Light: The indicating light consists of an FS Condulet with cover having a red jewel, a receptacle for 6-watt, S-6 lamp, and ½-inch hub.

CROUSE-HINDS

Types VAW and APB Boundary, Obstruction, and Range Lights

For Multiple Circuits

Description (Fig. Nos. below refer to page 5 of this section)			Cat. No.
APB	Multiple Disconnecting Boundary Light Complete with Globe, Cone, and Cutout		42957
	Multiple Disconnecting Obstruction Light Complete with Globe, Cone, and Cutout		42959
	Multiple Disconnecting Range Light Complete with Globe, Cone, and Cutout		42958
VAW	Boundary Light Complete with Globe (Fig. 1)		42967
	Single Obstruction Light Complete with Globe (Fig. 1)		42969
	Range Light Complete with Globe (Fig. 1)		42968
	Double Obstruction Light Complete with Globes (Fig. 2)		42970
	Single Body for Boundary, Obstruction, or Range Light Complete without Globe.		42961
Complete Assemblies With Support (Include Boundary Light, Cone, Pipe, Fittings, and Junction Box)	Boundary Light Complete for Fig. 7 Installation Below		42960
	Obstruction Light Complete for Fig. 7 Installation Below		43044
	Range Light Complete for Fig. 7 Installation Below		43043
	Boundary Light Complete for Fig. 8 Installation Below		43045
	Range Light Complete for Fig. 8 Installation Below		43046
	Obstruction Light Complete for Fig. 8 Installation Below		43047
Accessories	Cones	For Boundary Lights (Fig. 4)	KL1125
		For Obstruction Lights	KL1127
		For Range Lights	KL1126
	Globes	For Boundary Lights	KL846
		For Obstruction Lights	KL848
		For Range Lights	KL847
	Junction Box	With Hub Cover (Fig. 6)	43040
	Relay Box	Complete with Series Relay for 60 or 100-Watt Lamp (Fig. 3)	HL5556
	Indicating Light	Complete (Fig. 5)	HL5555
	Disconnecting Cutout Plug and Receptacle	With Cable	42749

Prices on application.
Catalog numbers do not include incandescent lamps.

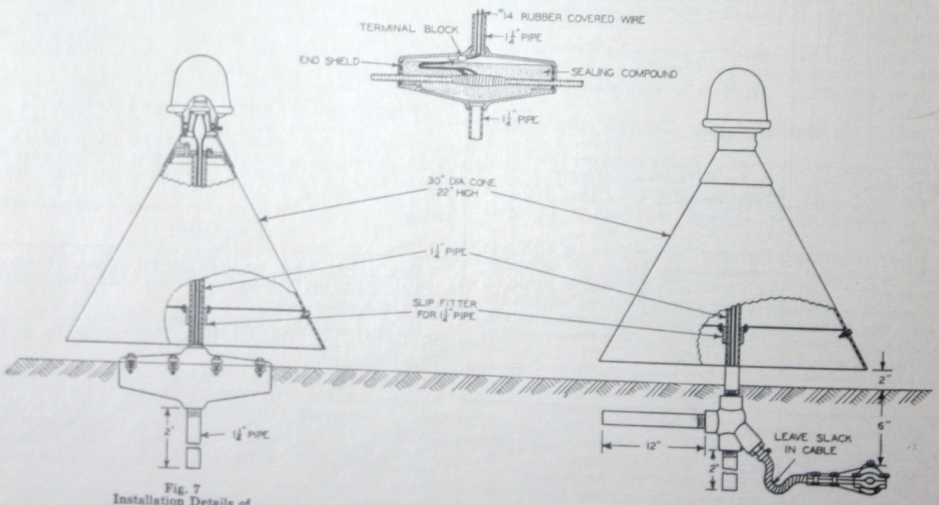


Fig. 7
Installation Details of
Multiple Boundary Light
Using Surface Type UGA Junction Box

Fig. 8
Installation Details of
Multiple Boundary Light
Using Split Tee and Box Buried Underground

CROUSE-HINDS

Type VAP Boundary, Obstruction, and Range Lights

Plain Globe Type—Series and Multiple Circuits—For Existing Installations

Fig. 1
Type VAP Series Unit
Without Guard

Fig. 2
Type VAP Series Unit
With Guard

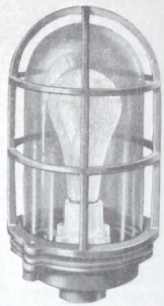


Fig. 3
Type VAP Multiple Unit
With Guard

Fig. 4
Type VAP Multiple Unit
Without Guard

Type VAP boundary, obstruction, and range lights listed on this page are of the plain globe type. They do not meet the Performance Specifications of the Department of Commerce, dated May 9, 1936, for new installations; but since this type has been installed at a great many airports, they are listed to take care of repairs and additions to existing installations. Repair parts for these units are listed in section 307, page 4.

Description		Without Guard Cat. No.	With Guard Cat. No.	Without Guard Cat. No.	With Guard Cat. No.
Take 600 or 1000-Lumen, 6.6-Ampere, S24½-Bulb Lamps—Equipped with Spring Clip Series Receptacle					
VAP Series	Size Hub	1½		2	
	With Frosted Globe	43012	43016	43020	43024
	With Green Globe	43013	43017	43021	43025
	With Red Globe	43014	43018	43022	43026
	With Amber Globe	43015	43019	43023	43027
Equipped with Edison Medium Screw Base Receptacle					
VAP Multiple	Size Lamps	25-Watt, 115-Volt, A-19 Bulb to 60-Watt, 115-Volt, A-21 Bulb		60-Watt, 115-Volt, A-21 Bulb to 100-Watt, 115-Volt, A-23 Bulb	
	Size Hub	1		1	
	With Clear Globe	42988	42992	42996	43000
	With Green Globe	42989	42993	42997	43001
	With Red Globe	42990	42994	42998	43002
	With Amber Globe	42991	42995	42999	43003

Housing: Cast aluminum.

Lamp Receptacles: Series Units—Spring clip series receptacles.

Multiple Units—Porcelain medium screw base.

See section 307, page 4.

Locking Screws: Standard units have knurled head screws to fasten the globe clamping ring to the body. Eccentric locking screws, which require a special wrench to operate, can be furnished.

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Type APB Boundary, Obstruction, and Range Lights

Plain Globe Type—Disconnecting—For Existing Installations

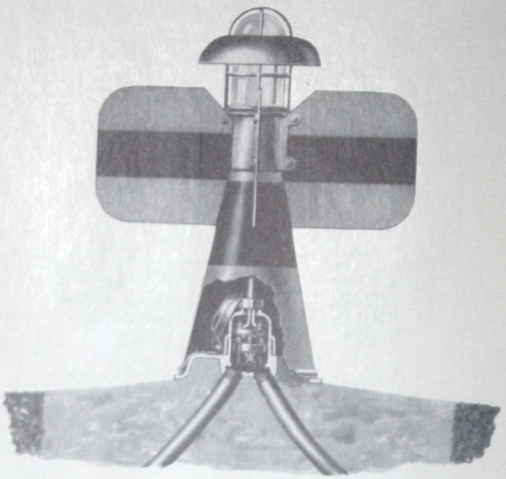


Fig. 5
Type APB
Broken-away View showing
Details of Plug and Receptacle

Type APB plain globe type disconnecting boundary lights do not meet the Performance Specifications of the Department of Commerce, dated May 9, 1936 for new installations. They are listed to take care of repairs and additions to existing installations. Type APB with prismatic globes, listed on page 4 of this section, are recommended for new installations.

Description			Without Reflector or Guard	With Reflector and Guard
			Cat. No.	
APB	With Ground Receptacle	Boundary Light with Frosted Globe	43092	40944
		Boundary Light with Amber Globe	43093	40945
		Obstruction Light with Red Globe	43095	40947
		Range Light with Green Globe	43094	40946
	Without Ground Receptacle	Boundary Light with Frosted Globe	KL1152	HL2200
		Boundary Light with Amber Globe	KL1153	HL2201
		Obstruction Light with Red Globe	KL1155	HL2203
		Range Light with Green Globe	KL1154	HL2202

Lighting Fixture: Cast aluminum, equipped with series film cutout receptacle for use with 600 or 1000-lumen, 6.6 ampere, S24½-bulb lamps.

Cone and Wings: Lead-coated, sheet steel with hand hole and door for access to plug and receptacle. Base of cone is 12 inches in diameter. It is held in place by spring clips attached to the receptacle housing.

Disconnecting Cutout Plug and Receptacle: Cast Feraloy cover is equipped with spring door to close the opening when the plug is withdrawn. The plug has a cast Feraloy housing and is furnished with a heavy two-conductor cable to connect to the boundary light. Two 1¼-inch tapped hubs are provided in the base for cable connections.

Net Weight: 45 lbs.

Shipping Weight: 80 lbs.

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Type APD Flush Marker or Boundary Lights

Fig. 1
Type APD—Forms 3 and 4
For Series or Large Multiple Lamps

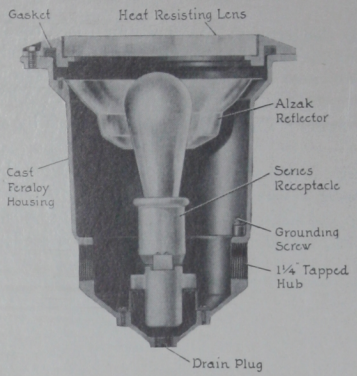


Fig. 2
Type APD—Form 4
Sectional View

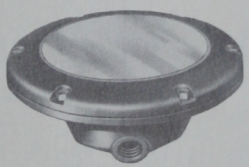


Fig. 3
Type APD—Form 1
For Small Multiple Lamps

Type APD marker or boundary lights are designed for installation where regular boundary lights would constitute an obstruction. The door and lens are designed so that a plane may taxi over them without damage. They can be used for traffic control, by outlining the 100-foot circle in the center of the field with alternate red and green units.

Description		Form 1 For Small Multiple Lamps	Form 3 For Large Multiple Lamps	Form 4 For Series Lamps
		Cat. No.	Cat. No.	Cat. No.
APD	With Clear Lens	40926A	.....	40927A
	With Clear Lens (Frosted)	41028A	41300A	41030A
	With Amber Screen	41029A	41417A	41031A
	With Green Screen	40931A	41418A	40955A
	With Red Screen	40930A	41419A	40954A

Prices on application.
Catalog numbers do not include incandescent lamps.

305 Miscellaneous
306 Hangar Lighting And Wiring
307 Ac... And Pa...
308 Indexes Airport

CROUSE-HINDS

Type APD Flush Marker or Boundary Lights

Housing: Cast Feraloy, hot-dipped galvanized.

Reflector: Etched Alzak, 70° beam with axis vertical.

Lamp Receptacles: For Multiple Circuits—Medium screw base (Cat. No. KL1158).

For Series Circuits—Spring clip film cutout (Cat. No. KL1102).

Wiring Connections: Two hubs for 1-inch conduit for small multiple units; and two hubs for 1¼-inch conduit for series and large multiple units, in base of housing. A grounding screw is provided on the inside of the housing.

Door Frame: Cast Feraloy, held in place by six cap screws.

Gasket: A rubber gasket is provided between the door and housing to make the joint watertight.

Lens: 8½-inch diameter, plain, heat-resisting glass, ⅞ inch thick, seated in plastic cement. See section 307, page 2.

Color Screens: Amber, green, or red, heat-resisting color screens can be mounted inside of the main lens.

Lamps: For Small Multiple Circuits—25-watt, 115-volt, A-19 bulb; 50-watt, 115-volt, A-19 bulb.

For Large Multiple Circuits—60 to 200-watt, 115-volt lamps. Lamp to be used must be specified.

For Series Circuits—6.6-ampere, 600 or 1000-lumen, S-24½ bulb.

Dimensions: Small Multiple Units—Height, 7¼ inches; diameter, 13 inches. Series and Large Multiple Units—See Fig. 4 below.

Finish: Hot-dipped galvanized.

Net Weights: Small Multiple Units, 32 lbs. Series and Large Multiple Units, 43 lbs.

Shipping Weights: Small Multiple Units, 40 lbs. Series and Large Multiple Units, 55 lbs.

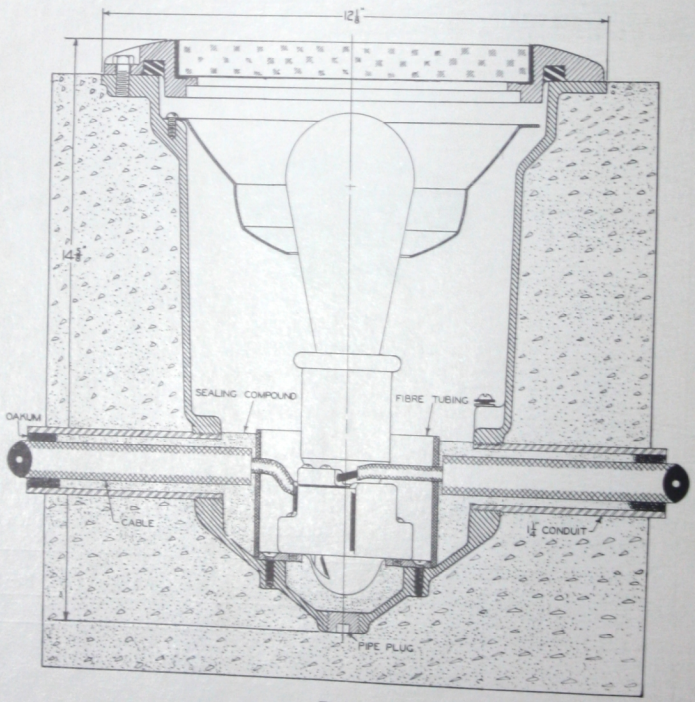


Fig. 4
Dimensions and Installation Details of APD Series Flush Boundary Light

CROUSE-HINDS

Type CPD Contact Lights

Fig. 1
Type CPD

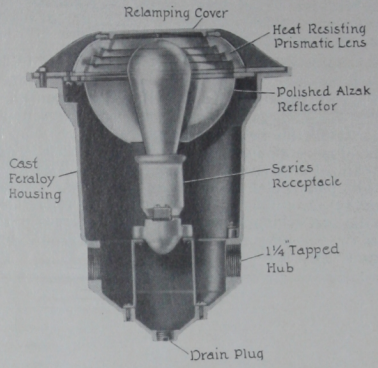


Fig. 2
Type CPD—Sectional View

Type CPD is a new unit designed to meet the requirements of the Department of Commerce for a contact light for Instrument Landing System runways, and for general runway outlining.

Type CPD contact light differs from former types of flush marker lights in that it projects a fan-shaped beam of light through 360° horizontally, and concentrates it vertically into a narrow beam projected within 2 to 10° above the ground. This beam gives a maximum indication to the pilot when landing, and it is particularly visible under conditions of poor visibility.

Contact lights are made for both normal and heavy duty and are described below.

Normal Duty: Has been defined by the Department of Commerce as the outlining of runways that are not equipped for Instrument Landings (sometimes referred to as Blind Landings). The recommended installation consists of two rows, one on each side of the runway at the edge of the paving. The spacing between rows should be at least 150 feet, and between the units, 200 feet. The present recommendations are for all white lights.

Heavy Duty: Has been defined by the Department of Commerce as the outlining of runways that are to be equipped for Instrument Landings. The recommended installation consists of two rows, one on each side of the runway, 200 feet apart. The spacing between the units should be 100 feet. The present recommendations are for the yellow lights on the first 1000 feet of the approach end of the runway. The lights in the next 3000 feet should be white. If the runway is longer than 4000 feet, the remaining lights should be yellow. This covers a one-way approach, which is the present plan for Instrument Landings.

Conversion of Existing Installations

Present installations of Crouse-Hinds type APD flush marker lights can be converted to contact lights by installing an adapter and the type CPD door, and adjusting the socket height. Information on conversion of any existing installation will be furnished on request.

Description		Normal Duty			Heavy Duty		
		Lamps		Cat. No.	Lamps		Cat. No.
		Lumens	Bulb		Lumens	Bulb	
CPD	With White Lens	320	S-24½	43079	4000	T-20	43083
	With Yellow Screen	1000	S-24½	43080	4000	T-20	43084
	With Green Screen	4000	T-20	43081†	4000	T-20	43081†
	With Red Screen	4000	T-20	43082†	4000	T-20	43082†

Prices on application.
Catalog numbers do not include incandescent lamps.
†Units with red and green color screens are the same for normal and heavy duty.

CROUSE-HINDS

Type CPD Contact Lights

Housing: Cast Feraloy, hot-dipped galvanized.

Reflector: Polished Alzak, attached to door frame (Cat. No. KL956).

Lamp Receptacles: The standard CPD contact light is intended for series operation and is furnished with a standard series clip film cutout receptacle. Units for Mogul screw base lamps are furnished with KL1102 receptacle. Units for medium Bipost base lamps are furnished with KL996 receptacle. Units can also be furnished for multiple operation. See section 307, page 2.

Wiring Connections: Two hubs 180° apart are tapped for 1¼-inch conduit.

Door Frame: Cast Feraloy, hot-dipped galvanized. It carries the complete assembly of lens, color screen, and reflector. After the unit has been wired, the joint between the door and the housing is sealed with plastic cement in addition to the wide rubber gasket. This makes a watertight joint which need not be disturbed. Relamping is readily accomplished by means of a bronze cover plate on the top, which is attached by four screws. This eliminates the necessity of breaking a joint at ground level every time a lamp is renewed.

Gaskets: A rubber gasket is provided between the main door and the housing (Cat. No. KL954), and between the relamping cover and the door (Cat. No. KL952).

Lens: Heat-resisting prismatic glass, designed to concentrate the light in a beam from 2 to 10° above the ground. It is one-piece with smooth outside surface (Cat. No. KL990).

Color Screens: Yellow, green, or red color screens can be attached to the relamping cover plate. The standard units have a 360° cylindrical screen. Screens can be furnished in 90-degree sections, so that different colored beams can be projected in different directions.

Lamps: For Normal Duty—White, 320-lumen; yellow, 1000-lumen; S-24½ bulb, 6.6-ampere Mogul screw base. Green and red, 4000-lumen, T-20 bulb, 6.6-ampere medium Bipost base.

For Heavy Duty—All colors—4000-lumen, T-20 bulb, 6.6-ampere medium Bipost base.

Net Weight: 50 lbs.

Shipping Weight: 65 lbs.

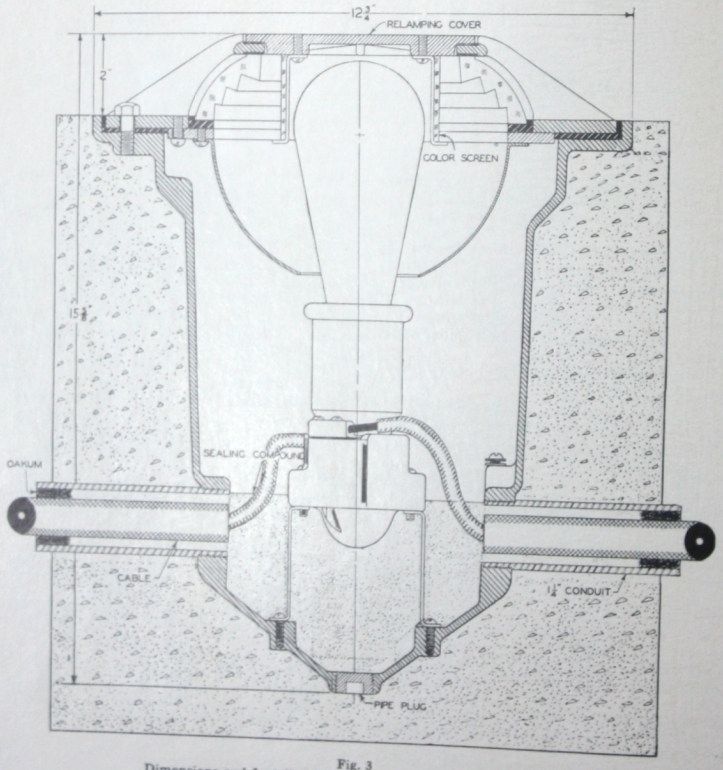


Fig. 3
Dimensions and Installation Details of Type CPD Contact Light

CROUSE-HINDS

Wind Cone Supports and Lighting Fixture

Fig. 1
Installation—Wind Cone Support and Lighting Fixture—Day View

Fig. 2
Installation—Wind Cone Support and Lighting Fixture—Night View

Crouse-Hinds wind cone support is made for the standard 36-inch, 12-foot wind cone. It is equipped with ball bearings at both top and bottom of the support ring. Above the ring is mounted a metal vane which materially assists in giving the correct wind direction when the wind cone is wet or frozen.

	Description (Fig. Nos. below refer to page 2 of this section)	Cat. No.
Wind Cone Supports	Complete with Lighting Fixture, but without Cone. For Roof Mounting (Fig. 3)	42955
	Complete with Lighting Fixture and Cone. For Roof Mounting (Fig. 3)	42956
	Complete with Lighting Fixture, but without Cone. For Side of Tower (Fig. 4)	43073
	Complete with Lighting Fixture and Cone. For Side of Tower (Fig. 4)	43074
Wind Cone Lighting Fixture Only	Complete with Obstruction Light, Four Reflectors, and Conduit Arms	42954

Installation: The wind cone can be mounted on the side of the beacon tower or on the roof of a hangar. It should be located so as to indicate the true wind direction and to be visible from all angles of approach and from any part of the field. Dimensions and installation details are given in Figs. 3 and 4, page 2 of this section.

Lighting Fixture: The wind cone lighting fixture consists of four reflectors mounted on conduit arms 90° apart at the proper height to provide uniform illumination on the wind cone, regardless of its position. All conduit above the cone support is furnished.

Obstruction Light: The center fitting consists of an obstruction light with red prismatic globe, four ½-inch hubs for the reflector supports, and a 1-inch bottom hub.

Lamps: For Reflectors—100-watt, A-23 bulb, 110-volt. For Obstruction Light—Clear, 60-watt, A21-bulb traffic signal lamps.

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Wind Cone Supports and Lighting Fixture

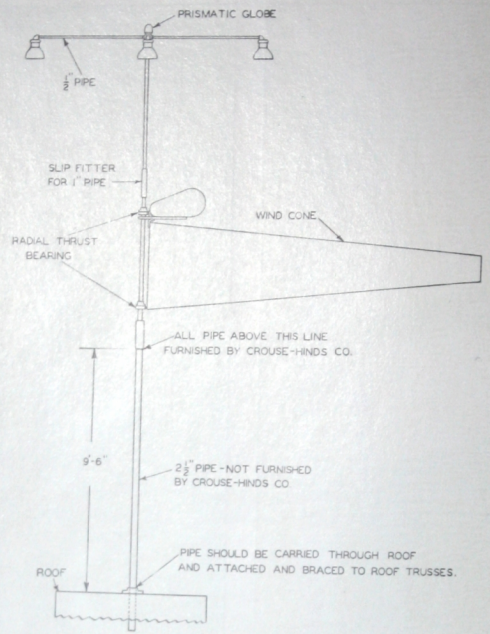


Fig. 3
Installation Details of Wind Cone Support and Lighting Fixture Mounted on Roof

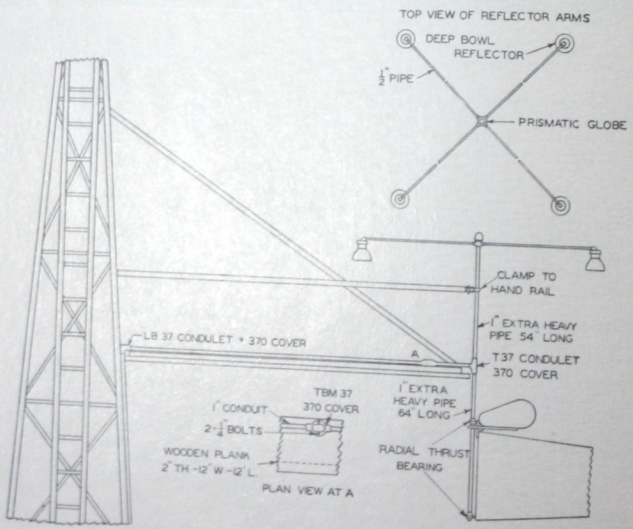


Fig. 4
Installation Details of Wind Cone Fixture on Beacon Tower

CROUSE-HINDS

Type UGA Underground Junction Boxes

For Splicing and Tapping Underground Cable

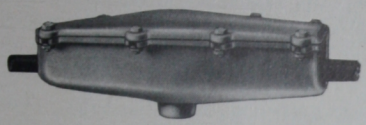


Fig. 1
Type UGA
With Blank Cover
For Straight Splice

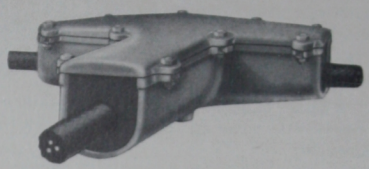


Fig. 2
Type UGA
With Blank Cover
For "T" Tap

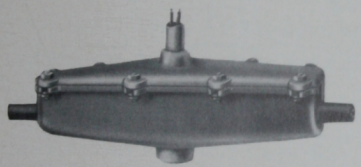


Fig. 3
Type UGA
With Hub Cover for Straight Splice
For Supporting Boundary Light Standard

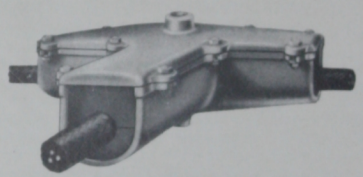


Fig. 4
Type UGA
With Hub Cover for "T" Tap
For Supporting Boundary Light Standard

Type UGA underground junction boxes are designed for splicing underground cable and for serving as supports for boundary lights at airports. The splice or tap can be made above ground and dropped into the box, after which the end shields are slipped around the cable, the box filled with compound, and the cover fastened in place. The end shields form a barrier of insulating material to hold the compound in place while it is setting. The construction of these boxes is such that it is possible to completely cover the splice with compound on the top, bottom, and sides before the cover is placed on. This is much easier than filling the box with compound through a small hole in the cover, and it is a simple matter to see that the splice is sealed perfectly before the cover is placed on the box.

The installation of multiple boundary lights shown in Fig. 5, page 4 is approved by the Department of Commerce. A terminal block is furnished, attached to the cover. If a boundary light is knocked over, the conduit support will usually break at the point where it enters the hub in the cover of the box. It is a simple matter to replace the installation, by removing the cover of the box, attaching a new conduit support, and running new leads from the terminal block. This is a considerable saving over the usual installation where a junction box must be dug up, and the compound melted, in order to install new leads.

Description		With Blank Cover		With 1¼-Inch Hub Cover	
		Cat. No.		Cat. No.	
UGA	For Straight Splice	Fig. 1	43038	Fig. 3	43040
	For "T" Tap	Fig. 2	43037	Fig. 4	43039

Prices on application.

CROUSE-HINDS

Type UGA Underground Junction Boxes

For Splicing and Tapping Underground Cable

Body: Cast Feraloy, galvanized finish, with minimum thickness of ¼ inch. At the bottom of all boxes, there is a blind hub tapped for 1¼-inch pipe, into which a length of anchor pipe may be screwed.

Covers: Cast Feraloy, galvanized finish, either blank or with 1¼-inch hub. Hub covers are furnished with a 2-wire terminal block, attached to the under-side of the cover.

Bolts: The bolts holding the cover on the box are ⅜ inch brass with square brass nuts.

Gasket: A gasket of impregnated asbestos roving, seals the joint between the cover and the box, making it completely watertight.

Compound: The through feed box requires 3 qts. of compound, and the "T" box, 4½ qts.

Cable: Type UGA underground junction boxes can be used to splice or tap cable up to and including 1½ inches external diameter. The exact diameter of the cable used must be specified on the order so that proper end shields can be furnished to fit the cable. These end shields are made for either round or flat cable and will accommodate any size cable up to 1½ inches in diameter.

Inside Dimensions: Straight Splice Box—Length, 16½ inches; width, 3½ inches; maximum depth, 3¾ inches.

"T" Tap Box—Same dimensions as straight splice box with the addition of side chamber for the tap, which has a length of 8¼ inches from the center line of the box to the end.

Net Weights: Straight Splice Box, 19 lbs. "T" Tap Box, 28 lbs.

Shipping Weights: Straight Splice Box, 21½ lbs. "T" Tap Box, 32 lbs.

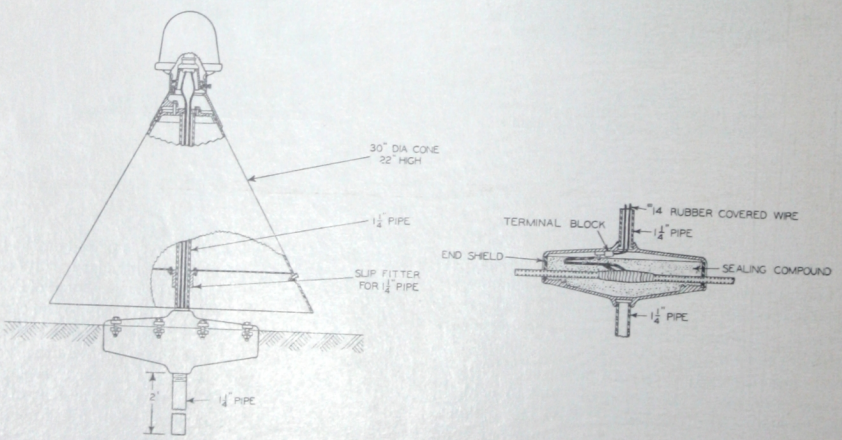


Fig. 5
Installation Details of Multiple Boundary Light
With Type UGA Underground Junction Box

CROUSE-HINDS

HG Series Roof Sign Fittings

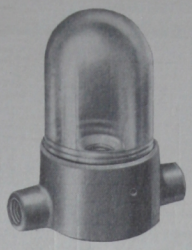


Fig. 1
Type HGC

HG series are recommended for outlining signs on roofs at airports and along airways. They are designed for mounting with the globe up; the globe seats on a rubber gasket and drain holes are provided in the side of the body to take care of any water which might follow the threads of the globe.

Complete detailed layouts of all letters and insignia with the recommended spacings and number of units required are given on pages 6 and 7 of this section.

Airport Roof Signs

The name of the airport and of the city or town should be placed on the roof of at least one outstanding airport building, or on other suitable area in such manner as to be legible from an altitude of at least 2,000 feet. Letters should be from 10 to 30 feet high, and must be at least 6 feet high. The letters should be chrome yellow, on a dead black background.

Airway Roof Signs

Signs on the roofs of buildings in cities or along airways should include the name of the town or city, a meridian marker, (True North Marker), and if there is an airport in the vicinity, a combination of simple characters indicating the direction and distance to the airport, the rating of the port, and whether facilities are available for landplanes, seaplanes, or both. The letters should be of the size and character described above under Airport Roof Signs.

Signs should be raised above the roof level if possible. If not, they can be painted directly on roofs of metal, shingles, concrete, slate, or tile. The letters can also be constructed of galvanized iron and placed flat on the roof or raised above the roof on suitable supports.

At night, the best method of illumination is by exposed lamps in HG series fittings. The drawings on page 6 give the details of letters, and those on page 7 of meridian and airport markers. Crouse-Hinds engineers will gladly assist in designing illuminated roof signs. Requests for recommendations should include a scale drawing of the roof and complete details as to true north, the direction of and distance to the airport, and a description of its facilities and rating.

Wiring

A line of conduit should be run directly below the sign with a T Condulet, making connection to each letter at the point indicated on the layouts of the letters. The wire used should be heavy enough to hold the voltage drop to not more than 5% at the farthest lamp. It will be found that ½-inch HG series fittings are large enough for the majority of signs.

	Type	½	¾	1	Color Globe	½	¾	1	Type	
		Cat. No.				Cat. No.				
	HG	HG10	HG20	HG30	Clear	HGC10	HGC20	HGC30	HGC	
		HG11	HG21	HG31	Opal	HGC11	HGC21	HGC31		
		HG12	HG22	HG32	Green	HGC12	HGC22	HGC32		
		HG15	HG25	HG35	Red	HGC15	HGC25	HGC35		
		HG16	HG26	HG36	Amber	HGC16	HGC26	HGC36		
	HGL	HGL10	HGL20	HGL30	Clear	HGT10	HGT20	HGT30	HGT	
		HGL11	HGL21	HGL31	Opal	HGT11	HGT21	HGT31		
		HGL12	HGL22	HGL32	Green	HGT12	HGT22	HGT32		
		HGL15	HGL25	HGL35	Red	HGT15	HGT25	HGT35		
		HGL16	HGL26	HGL36	Amber	HGT16	HGT26	HGT36		
	HGX	HGX10	HGX20	HGX30	Clear	Connectors Threadless Thin Wall				
		HGX11	HGX21	HGX31	Opal					
		HGX12	HGX22	HGX32	Green	½	UCA164		UCA	
		HGX15	HGX25	HGX35	Red	¾	UCA264			
		HGX16	HGX26	HGX36	Amber	1	UCA364			

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

HG Series Roof Sign Fittings

Letters

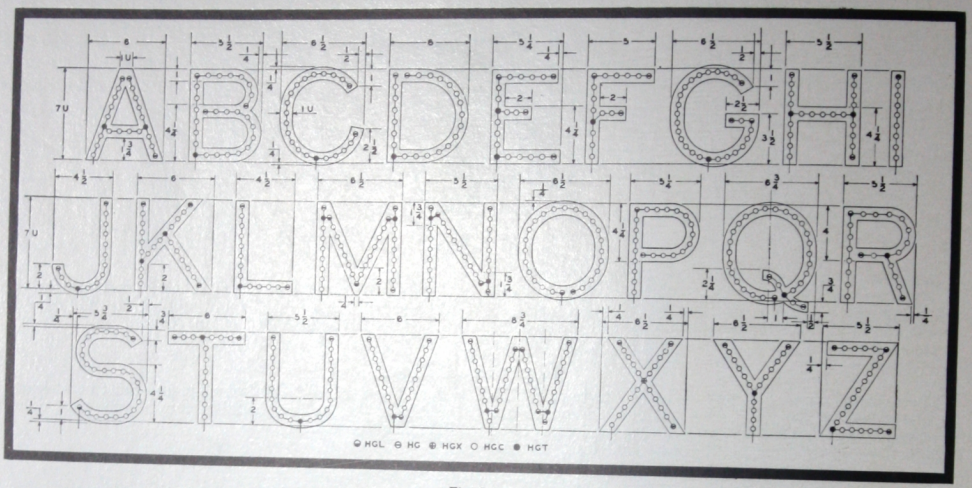


Fig. 2

The dimensions shown on the above letters are in terms of the unit of measure of Gothic lettering, which is one-seventh of the height. The thickness of all strokes is one unit. The spacing between letters should be not less than one-fourth of the letter height. All letters must be at least six feet high. Outlets must be placed on eight-inch centers for six-foot letters, increasing to twelve inches for twelve-foot letters, or larger. Lamps should be not less than 10-watt. Fittings indicated on letters are for six-foot letters.

Number of HG Series Required for Letters for Roof Signs

Letter	Type of Fitting						
	HGC				HG	HGL	HGT
	Size of Letters (Height)				All Sizes		
	6-Foot	10-Foot	15-Foot	20-Foot			
A	17	24	31	44	3	0	2
B	23	31	46	64	2	1	1
C	18	24	32	42	2	0	1
D	20	27	40	52	2	0	1
E	15	23	31	43	3	1	2
F	12	18	24	33	2	1	1
G	23	28	37	50	2	1	1
H	18	25	36	47	3	0	2
I	8	9	14	19	1	0	0
J	11	14	20	28	2	0	1
K	19	26	35	48	3	0	2
L	11	16	20	27	2	0	1
M	25	39	49	69	3	3	2
N	20	29	39	55	3	2	2
O	22	30	38	50	1	1	0
P	20	26	35	46	1	1	0
Q	26	38	47	63	2	1	1
R	18	31	42	56	2	1	1
S	22	28	37	50	1	1	0
T	12	18	24	32	2	0	1
U	18	26	34	44	2	0	1
V	14	20	28	38	2	1	1
W	23	31	47	67	3	1	1
*X	16	24	32	44	3	4	2
Y	14	19	25	33	3	0	0
Z	18	22	32	41	2	0	1
					2	1	1

*Letter "X" requires one type HGX.

CROUSE-HINDS

HG Series Roof Sign Fittings

Airway Roof Signs

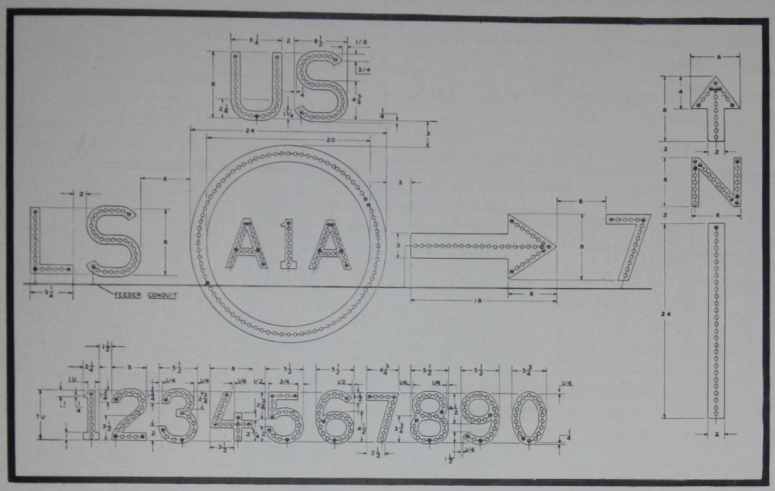


Fig. 1

Markers for Airway Roof Signs

Meridian Marker: The letter N should be from 6 to 12 feet in height, with the rest of the marker in the proportion shown in the above drawing.

Airport Pointer: This consists of a circle with an arrow and figure indicating the direction and mileage to the airport. Lettering within the circle gives the rating of the airport. In the case of seaplane airports the letter "S" precedes the circle. For landplane airports offering seaplane facilities, the letters "LS" precede the circle. The "US" shown above the circle is used for airports that have been designated by the Federal Government as airports of entry of the United States. Seaplane airports with facilities for landplanes should have the letters "SL" preceding the circle. Airport pointers used to indicate unrated municipal or commercial airports, Federal airdromes, or intermediate landing fields should use the letters "M," "C," "F," or "I" respectively. The letters within the circle should be from 6 to 12 feet high. The dimensions given on the pointer are in feet to correspond to 6-foot letters within the circle. The number of HG fittings required for these markers are given in the table below. Letters for airport ratings and name of city can be taken from page 6.

Number of HG Series Required for Airway Roof Signs

Fittings Used in	Letter or Numeral	Type of Fitting: HGC, Size of Letters (Height) 6-Ft.	8-Ft.	10-Ft.	11-Ft.	12-Ft.	14-Ft.	16-Ft.	HG All Sizes	HGL All Sizes	HGT All Sizes	HGX All Sizes
Letters	U		22		28		30	34	2	0	1	0
	S		26		31		32	37	1	1	0	0
	L		13		17		18	20	2	0	1	0
Numerals	1	7	8	11	11	11	13	14	1	0	0	0
	2	14	17	24	24	24	28	33	2	0	1	0
	3	12	16	22	22	22	27	32	2	1	1	0
	4	10	12	20	20	21	21	22	3	1	0	1
	5	13	18	22	26	26	32	36	2	2	1	0
	6	18	23	30	30	31	37	42	2	0	1	0
	7	10	13	17	18	19	20	21	1	1	0	0
	8	20	24	34	34	36	40	50	2	0	1	0
	9	18	23	30	30	31	37	42	2	0	1	0
	0	16	20	26	26	26	32	36	1	1	0	0
Airway Circle		81	109	117		141			2	0	1	0
Airport Pointer		29	43	51		62			3	2	0	1
Meridian Marker — Head	N	10	17	24		31			3	3	0	1
Meridian Marker — Letter	N	20		29		37			3	2	2	0
Meridian Marker — Tail	N	27	37	43		47			1	0	0	0

CROUSE-HINDS

HG Series Roof Sign Fittings

Body: Cast aluminum bodies are standard, although cast brass can be furnished at an advance in the list prices. Hubs are cast solid with the body and have an integral bushing and tapered thread.

Globes: Clear, opal, green, red, and amber, threaded to fit body.

Lamp Receptacle: Medium screw base.

Lamps: Any lamp up to 50-watt bulb.
Lamps recommended—
Clear globes—10-watt, S-14 bulb.
Amber globes—15-watt, A-17 bulb.
Red and green globes—25-watt, A-19 bulb.

Connectors for Thin Wall Conduit: Where it is desired to use thin wall conduit, HG series fittings can be used by screwing a type UCA connector into each hub.

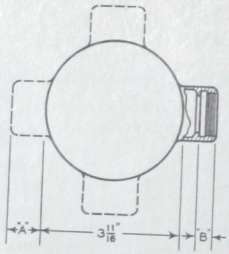


Fig. 2
Dimensions—HG Series

Hub Size	A	B
1/2	7/8	3/4
3/4	7/8	3/4
1	1	7/8

CROUSE-HINDS

Type YKWC Transformer Housings

Weatherproof

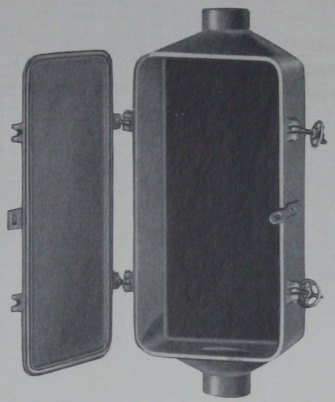


Fig. 1
Type YKWC

When installing airport equipment, it is essential that the incandescent lamps of the lighting units be burned at their normal voltage, and, since many of these units require the use of 30 and 32-volt lamps, it is necessary to install transformers to reduce the lighting voltage to the lamp voltage.

In order to save long runs of large sized wire, it is advisable that the transformer be mounted immediately adjacent to the lighting unit, in a weatherproof housing.

On this page there are listed several type YKWC cabinets which are sufficiently large to house the ordinary 1000-watt, 1500-watt, and 3000-watt transformers, having either 110, 220, or 440 volts primary with sufficient taps to insure correct operating voltage. Ofttimes the underground feed for the lighting unit comes up through the supporting standard, and, when this is the case, a transformer housing with 2½ or 4-inch hubs should be used.

These transformer housings are made of the best quality cast Feraloy free from blowholes, and are galvanized to prevent corrosion. The door is seated against a large rubber gasket and the hinges are adjustable so that a perfect fit is always assured. These housings are equipped with hasps and staples so that an ordinary padlock may be used to prevent opening by unauthorized persons, and are sufficiently large to house not only the transformer but a set of fuses, which are so necessary to assure adequate protection to the lighting circuit.

Type	Size Hub	Height Over Hub, Inches	Inside Dimensions in Inches			Cat. No.
			Height	Width	Depth	
YKWC	1¼ 1½ 2 2½	27⅜	20½	10¼	6½	45741 45742 45743 45744
	1¼ 1½ 2 2½	31	24	11¼	7⅝	45745 45746 45747 45748
	2½ 4	41	32½	13	9½	45749 45750

Prices on application.

CROUSE-HINDS

Portable Traffic Signals

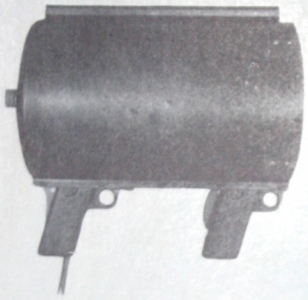


Fig. 2
Portable Traffic Signal

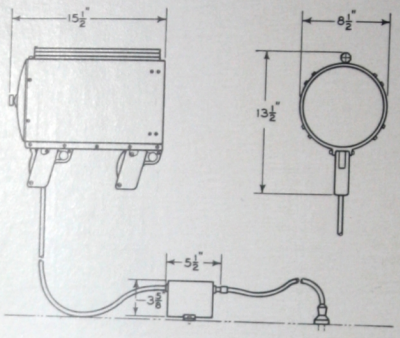


Fig. 3
Dimensions—Portable Traffic Signal

The portable traffic signal is a small, light weight searchlight, which can be held by the operator and aimed at the plane that he wishes to signal. It is equipped with two pistol grip handles with trigger controls for the lamp and the color screens. The signal is readily visible either day or night, and an indicating lens on the back of the unit shows the operator the color of signal being projected.

Description	Rating	Cat. No.
Portable Traffic Signal with Transformer	115-Volt, 60-Cycle	43048
Portable Traffic Signal Only	6-Volt	43049

Reflector: Precision silvered glass.

Color Screens: Red and green, mounted between the lamp and the main reflector. Green is normally in position. Pulling the trigger and squeezing the rear lever of the front grip moves the red screen into operating position.

Operating Contacts: The contacts and fuses are located in the rear grip. When the rear lever on the rear grip is pressed, the lamp is connected to the circuit through a resistance which passes sufficient current to preheat the lamp. When the trigger is pulled, a set of contacts short circuit the resistance and bring the lamp to full brilliancy.

Wiring: Twenty feet of cable is provided between the unit and the transformer, and three feet from the transformer to the plug. The transformer can be wired to special receptacles at convenient points if desired.

Lamps: 50-candlepower, 6-volt spotlight lamp. Two lamps are furnished with each unit.

Net Weight: Unit Only, 7 lbs.

Shipping Weight: Unit with Transformer, 35 lbs.

Prices on application.

CROUSE-HINDS

Auxiliary Floodlights and Searchlights

For Loading and Service Areas

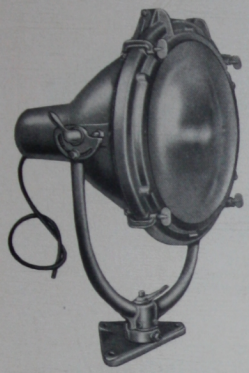


Fig. 1
Type ADE Floodlight
With Standard Mounting

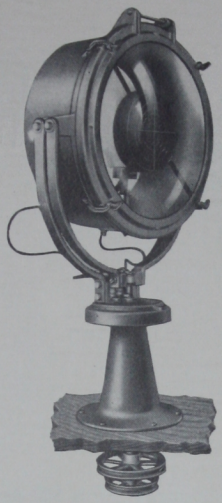


Fig. 2
Type DCXR Searchlight
Remote Control

Fig. 3
Remote Control
Wheel Assembly

Closed Floodlights

Types ADE-14 and ADE-16 closed floodlights are high grade floodlights of sturdy construction. They are dust-tight and weatherproof with housing and mounting of cast aluminum. These floodlights are highly recommended for the lighting of aprons, loading and service areas and other points requiring dependable outdoor illumination.

These areas require light intensities varying from a minimum of two foot candles to a maximum of five foot candles. These intensities can be obtained with type ADE floodlights by using from .2 to .5 watts per square foot of area. The floodlights should be mounted as high as is practical. Sufficient floodlight locations should be selected so that each part of the area is lighted from more than one direction, thus eliminating annoying shadows. Floodlights with horizontal spread lenses will be found to give the best distribution for most applications; diffusing lenses can be used for short range, and plain lenses for long range.

Types ADE-14 and ADE-16 floodlights are described and listed in Floodlight Catalog 316, section 201, pages 7 to 10.

Searchlights

Many airports have found that a powerful incandescent searchlight, mounted on the control tower or some other convenient point provides a valuable emergency lighting device. The Crouse-Hinds Company manufactures a complete line of searchlights from 14 to 24 inches in diameter. Searchlights can be provided for hand control, pilot house lever control, or remote control. Type DCXR remote control searchlight is shown in Fig. 2. Listings and descriptions are given in Floodlight Catalog 316, section 205. The searchlight recommended is the 24-inch, equipped with automatic lamp-changer for the 1000-watt, T20-bulb, 30-volt lamp.

Description		Lens	Lamp		With Standard Mounting	With Slip Fitter
			Watts	Bulb	Cat. No.	Cat. No.
ADE-14	With Wide Beam Polished Alzak Reflector.	Spread	500	PS-40	43058	43061
	With Narrow Beam Polished Alzak Reflector.	Spread	500	PS-40	43059	43062
	With Narrow Beam Polished Alzak Reflector.	Spread	500	G-40	43060	43063
ADE-16	With Wide Beam Polished Alzak Reflector.	Spread	1000	PS-52	43064	43067
	With Narrow Beam Polished Alzak Reflector.	Spread	1000	G-40	43065	43068
	With Narrow Beam Polished Alzak Reflector.	Spread	1000	PS-52	43066	43069

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Auxiliary Floodlights

For Service Areas and Parking Spaces

Fig. 4
Type MDB
With Standard Base

Fig. 5
Type MUA Alumalux
With Slip Fitter

Types MDB-14 and MDB-16 Floodlights—For 500 or 1000-Watt PS-Bulb Lamps

Types MDB-14 and MDB-16 are light weight, low-priced, weatherproof floodlights. They are equipped with heat-resisting clear lenses. They are listed with three types of reflectors giving beam spreads that vary from narrow beam for long range or restricted area lighting, to wide beam for short range wide area lighting.

For lighting aprons and service areas, from .25 to .6 watts per square foot should be used with these floodlights to produce from two to five foot candles.

These floodlights are listed and described in Floodlight Catalog 316, section 201, pages 25 and 26.

Description		With Wide Beam Etched Alzak Reflector 115° Spread	With Medium Beam Etched Alzak Reflector 70° Spread	With Narrow Beam Polished Alzak Reflector 20° Spread
		Cat. No.	Cat. No.	Cat. No.
MDB-14 500-Watt	With Standard Base	42491	42461	42462
	With Slip Fitter	42487	42495	42721
	With Cross-Arm Base	42488	42496	42722
MDB-16 1000-Watt	With Standard Base	42490	42465	42466
	With Slip Fitter	42484	42492	42498
	With Cross-Arm Base	42485	42493	42499

Type MUA Open Floodlights—For 1000 or 1500-Watt, PS52-Bulb Lamps

Type MUA Alumalux floodlights are efficient, low-priced open floodlights with the same range of beam spreads available as furnished with the type MDB units listed above. They are used for lighting of parking areas and other miscellaneous lighting around the airport. The wattage required for parking area lighting with these floodlights will vary from .1 to .2 watts per square foot. If the floodlights are mounted at the edge of the area to be lighted, the wide beam reflector should be used. If they are mounted back from the edge of the area or the area is over 75 feet wide, the medium beam reflector will usually provide better light utilization.

Type MUA floodlights are listed and described in Floodlight Catalog 316, section 202, pages 1 to 16.

Description		With Wide Beam Etched Alzak 16-Inch Reflector 115° Spread	With Medium Beam Etched Alzak 18-Inch Reflector 70° Spread	With Narrow Beam Polished Alzak 18-Inch Reflector 20° Spread
		Cat. No.	Cat. No.	Cat. No.
MUA	With 1½-Inch Slip Fitter	42391	42394	42397
	With Cross-Arm Base	42392	42395	42398
	With Pole Bracket	42393	42396	42399

Prices on application.
Catalog numbers do not include incandescent lamps.

CROUSE-HINDS

Condulets for Hangar Lighting and Wiring

Fig. 1
Type LB

Fig. 2
Type T

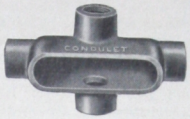


Fig. 3
Type X

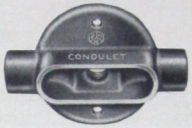


Fig. 4
Type TBM

Fig. 5
Type FSD, *Three-Gang*
Junction Box
With Blank Cover

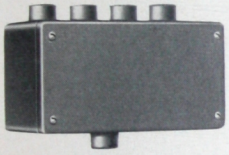


Fig. 6
Type FDB, *Four-Gang*
Junction Box
With Blank Cover

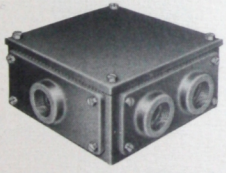


Fig. 7
Type RS
Junction Box
With Hub Plates

Threaded hub Condulets should be used for all conduit wiring in hangars. Their use insures a rigid mechanical job, water and vaportight joints and accessories, and effective continuity of metal conduit ground.

Each type is especially designed to meet a certain requirement. There are Condulets that permit the mounting of a great variety of covers and wiring devices; those that can be used as junction boxes only; those that have removable conduit hub plates for tapping a conduit system after an installation is completed; those that house a switch or plug receptacle; and those that may be classed as special conduit outlets.

FS and FD series junction boxes illustrated on this page provide a wide variety of sizes, with a great many hub combinations. The RS series with conduit hub plates provide desirable junction boxes that are vaportight.

Wedgtite pipe hangers are available for installation with pipe running parallel with or at right angles to a steel beam. Conduit supporting vaportight lights and Condulets can readily be suspended from the hangar roof girders by means of *Wedgtite* pipe hangers.

AL series of fixture hanger Condulets are made in ball and cushion styles, and are available in several hub combinations.

FS series vaportight Condulets are for the control of small lighting circuits and are provided with covers for the operation of either push button or tumbler switches.

FA series Condulets are for the control of large lighting circuits and are provided with water and vaportight covers, and can be furnished in single, two, three, and four gangs.

Type GCH Groundulets are attached to a water pipe by rigid clamp jaws, insuring permanent and positive contact. A single substantial bolt holds the assembly in firm contact with both the water pipe and the grounding conductor.

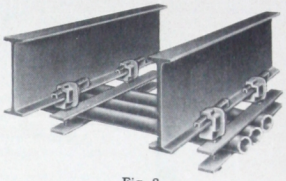


Fig. 8
Type CHU *Wedgtite* Pipe Hanger
Installed
Pipes Suspended from
Steel Beams

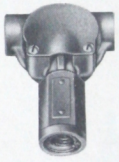


Fig. 9
Type ALC
Cushion Fixture Hanger

Fig. 10
Type GCH
Groundulet

Fig. 11
Type FS Condulet
With Vaportight Cover
and Tumbler Switch

Fig. 12
Type FS Condulet
With Vaportight Cover and
Three Tumbler Switches

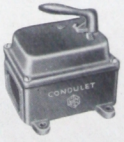


Fig. 13
Type FA Condulet
With Watertight Cover

Fig. 14
Type FA, *Three-Gang* Condulet
With Watertight Covers

Condulets are listed and described in Condulet Catalog 2500, which will be sent on request.

307 Ac... And Fe...
308 Indexes Airport

CROUSE-HINDS

Condulets for Hangar Lighting and Wiring

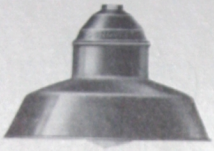


Fig. 15
Type VDB
Vaportight Fixture

Lighting

For overhead lighting, vaportight lighting fixtures are usually considered desirable. Type VDB vaportight lighting fixtures with dome reflectors are recommended. Areas used for live storage should be lighted to an intensity of 10 foot candles. Under average conditions this will require approximately two watts per square foot of floor area. Areas used for repair purposes should be lighted to at least twice this intensity. Maximum spacing distances are given in the table below.

For high intensity vertical lighting, type RM floodlights, described on page 3 of this section, should be used in addition to overhead lighting.

Crouse-Hinds engineers will be glad to recommend the best lighting installation for any hangar on receipt of detailed plans.

Fig. 19
Type ARE
Arktite Plug Receptacle

Spacing Between Lighting Units

Ceiling Height in Feet	Spacing Between Units in Feet
8	7
10	9
12	10 to 12
14	10 to 13
16	10 to 13
18	10 to 20
20	18 to 24

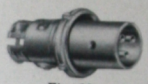


Fig. 20
Type AP
Arktite Plug

Fig. 16
Type EVH
Explosion-Proof Hand Lamp

Hangar Lighting and Wiring

Wiring: Conditions in a hangar are similar to those in a garage. Any electrical equipment such as plug receptacles which are located within four feet from the floor must be explosion-proof. For this purpose, type CES receptacles and type CPH plugs are recommended (illustrated on page 4 of this section). Where receptacles are located more than four feet above the floor, type ARE *Arktite* receptacle with type AP *Arktite* plug is recommended for power outlets where plugs are used as circuit breaking devices. Types BRME receptacles or FS series Condulets with DS82 receptacle and WP731 plug are recommended as outlets for hand lamps.

Condulets with threaded hubs should be used at all outlets to insure a rigid mechanical job, water and vaportight joints, and effective continuity of ground.

Hand Lamps: Hand lamps used in a hangar should be of the explosion-proof type, as they are in the area adjacent to the floor where gasoline vapors present a hazard. Explosion-proof hand lamps are also much safer to use adjacent to doped or lacquered surfaces, as they operate at a much lower temperature than do open type hand lamps. Type EVH explosion-proof hand lamps are recommended.

In places where explosion-proof hand lamps are not required, type VS 100-watt vaportight hand lamps are recommended.

Fig. 21
Type BRME
Plug Receptacle

Fig. 17
Type VS, 100-Watt
Vaportight Hand Lamp

Fig. 22
Type BP Plug
For Types BRD and
BRME Plug Receptacles

Fig. 18
Type ALC
Cushion Fixture Hanger

Fig. 24
Type BRD
Plug Receptacle for
FS Series Condulets

Fig. 23
Type FS Condulet
With DS82 Receptacle and WP731 Plug

Condulets are listed and described in Condulet Catalog 2500, which will be sent on request.

CROUSE-HINDS

Lighting of General Hangar Areas

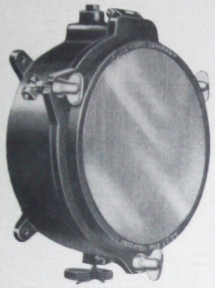


Fig. 1
Type RM-12
With Spread Lens

Fig. 2
Type RMF-12
With Spread Lens

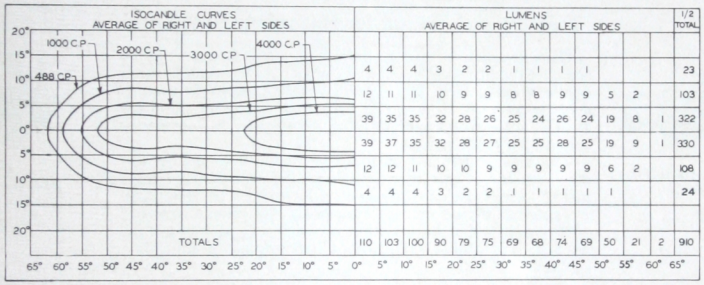


Fig. 3
Candlepower Distribution Curve
Types RM-12 and RMF-12 with Polished Alzak Reflector,
100° Spread Lens, and 200-Watt, PS30-Bulb Lamps

The real lighting problem in a hangar is to provide a high intensity vertical illumination on the sides of the planes and under the wings. This can be accomplished efficiently and economically by using types RM-12 or RMF-12 floodlights mounted on the side walls. These floodlights are furnished with polished Alzak reflectors and with 100° horizontal spread lenses. The unusually wide horizontal and narrow vertical spreads of these units provide uniform lighting over a wide area with a minimum of glare.

The spacing and mounting height depends on the size of the hangar and the size of the planes being handled. In general, a horizontal spacing of 20 to 25 feet is satisfactory. The average mounting height is 8 feet, and 200-watt, PS30-bulb clear General Lighting Service lamps should be used.

Type RM-12 units are made for surface mounting. They have four lugs with holes for ¼-inch bolts, by which they can be bolted to the wall, and are provided with ¾-inch threaded hubs at the top and bottom. Type RMF-12 units are made for flush mounting in a wall, with a projection of only 2¾ inches from the surface, and have a flange to cover the opening in the wall. They are provided with two side hubs for through feed, tapped for ¾-inch conduit, but they can be furnished tapped for any size up to 1¼ inches. Types RM-12 and RMF-12 units are listed and completely described in Floodlight Catalog 316, section 201, pages 21 and 22.

Type	Mounting	Lamp		Lens	With Narrow Beam Polished Alzak Reflector
		Watts	Bulb		Cat. No.
RM-12	Surface	200	PS-30	100° Spread	43097
RMF-12	Flush	200	PS-30	100° Spread	42930

Prices on application.
Catalog numbers do not include incandescent lamps.

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CROUSE-HINDS

Condulets for Hangar Lighting and Wiring in Hazardous Locations

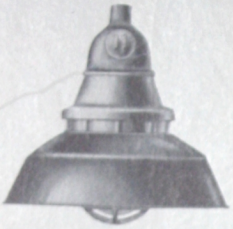


Fig. 4
Type EVA Fixture with Dome Reflector

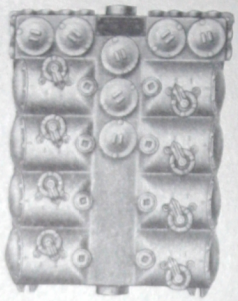


Fig. 5
Type FLP Panelboard

Fig. 6
Type EVBX Fixture with Angle Reflector

Lighting and Wiring for Hazardous Locations

Certain areas in airport buildings, such as dope rooms, are classified by the Underwriters' Laboratories as hazardous locations. The lighting and wiring equipment used in such areas must be designed to operate safely in the presence of explosive vapors. Such equipment is commonly called **Explosion-proof.**

The Crouse-Hinds Company has been a leader in the development of explosion-proof lighting and wiring equipment. Some of this equipment is illustrated on this page. A complete listing of explosion-proof equipment together with considerable information on wiring requirements for hazardous locations will be found in Condulet Catalog 2500, section 85.

Fig. 7
Type GUAC Junction Box
With Union Hubs

Fig. 10
Type EFSC
Push Button Switch Condulet

Dope Rooms

Dope rooms are hazardous locations, and all fixtures must be explosion-proof. EV series lighting fixtures with dome reflectors should be used for overhead units; and where side lighting is required, type EVBX units attached to the side walls and equipped with angle reflectors should be used. Dope rooms and similar areas should be lighted to an average intensity of at least 20 foot candles. This requires, under average conditions, approximately 4.5 watts per square foot of floor area. The table below gives the recommended spacing for various mounting heights. Lighting layouts to fit any particular job will be furnished by Crouse-Hinds Illumination Department on receipt of detailed plans and a description of the operations to be conducted in the area involved.

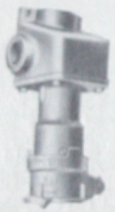


Fig. 8
Type CES
Delayed Action *Arktite*
Plug Receptacle

Fig. 11
Type FLB
Circuit Breaker Condulet

Spacing Between Lighting Units

Ceiling Height in Feet	Spacing Between Units in Feet
8	7
10	9
12	10 to 12
14	10 to 13
16	10 to 13
18	10 to 20
20	18 to 24

Fig. 9
Type CPH Plug
For Type CES Receptacle

Fig. 12
Type EZS
Sealing Condulet

Explosion-proof and dust-tight Condulets for hazardous locations are listed in Condulet Catalog 2500, section 85.

CROUSE-HINDS

Incandescent Lamps

For Use with Airport Lighting Equipment

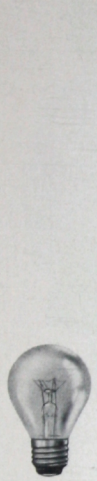


Fig. 1

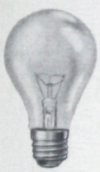


Fig. 2


Fig. 3


Fig. 4

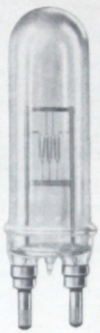


Fig. 5

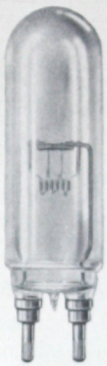


Fig. 6

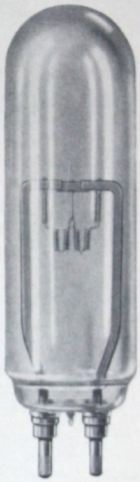


Fig. 7

The Crouse-Hinds Company does not manufacture or sell lamps. The lamps listed below are the special types used in airport lighting equipment. Common types of General Lighting Service lamps are not listed. The information given on this page is taken from the data books of the Mazda lamp manufacturers and is not guaranteed by the Crouse-Hinds Company. Lamps can be purchased on lamp contracts at substantial discounts.

Voltage: The voltage at which an incandescent lamp operates is of extreme importance. The circuit voltage at the lamp should correspond with the rated voltage of the lamp. Trouble with lamps burning out frequently can usually be traced to high voltage. 110-volt lamps can be obtained rated at 105, 110, 115, 120, 125, or 130 volts. The safest way is to check the voltage at the lamp receptacle terminals with a voltmeter at night, while the light is in operation, and then if the voltage does not equal the rated lamp voltage which is etched on the bulb, lamps of the nearest voltage rating should be obtained.

Lamp Life: The hours of life given in the table below are rated average hours. Some lamps will burn longer, and others will burn less than their rated life, but under the usual operating conditions the average number will come close to their rated life.

By the law of averages, several short-life lamps may be found in one installation, but these short-life lamps will be compensated for by other lamps which last much longer than their rated life.

Fig. No.	Watts	Volts	Bulb	Base	Light Center Length	Life in Hours	Lumens	Filament	List, each	Lighting Service	Used in Types
7	3000	32	T-32 Clear	Mg. Bip.	$5\frac{3}{4}$″	100	84000	C-13B	$25.00	Aviation	DCE-24
6	1500	32	T-24 Clear	Mg. Bip.	4″	100	42000	C-13B	15.00	Aviation	DCE-24
5	1000	110	T-20 Clear	Mg. Bip.	4″	500	20500	C-13	6.50	Aviation	DCB-24, DCB-36
5	1000	30	T-20 Clear	Mg. Bip.	4″	500	24000	C-13	7.00	Aviation	DCB-24, DCB-36
5	500	110	T-24 Clear	Mg. Bip.	4″	500	8800	C-13B	6.00	Aviation	DCB-224
..	500	110	PS-40	Mg. Pf.	.....	1000	9800	C-7A	2.15	General	FCB-12
3	420	12	G-25 Clear	Mg. Pf.	$1\frac{11}{16}$″	100	10500	C-2	6.00	Aviation	DCE-16
..	200	110	PS-30	Mg. Pf.	.....	1000	3400	C-9	1.05	General	FCB-12
2	100	110	A-21 Clear	Med.	$2\frac{7}{16}$″	2000	1270	C-9	.50	Traff. Sig.	VAW, APD
2	67	110	A-21 Clear	Med.	$2\frac{7}{16}$″	3000	650	C-9	.35	Traff. Sig.	VAW, APD
2	60	110	A-21 Clear	Med.	$2\frac{7}{16}$″	2000	654	C-9	.30	Traff. Sig.	VAW, APD
1	15	110	A-17 Clear	Med.	$2\frac{3}{8}$″	1000	140	C-7A	.20	General	VAW, APB
..	4000 Lumen	6.6 amp.	T-20	Med.Bip.	4″	2000	4000	CC-6	1.55	Street Ltg.	CPD
4	1000 Lumen	6.6 amp.	S-24$\frac{1}{2}$	Mog.	$5\frac{3}{8}$″	2000	1000	C-8	.50	Street Ltg.	VAW, APB, APD, CPD
4	600 Lumen	6.6 amp.	S-24$\frac{1}{2}$	Mog.	$5\frac{3}{8}$″	2000	600	C-8	.55	Street Ltg.	VAW, APB, APD, CPD
4	320 Lumen	6.6 amp.	S-24$\frac{1}{2}$	Mog.	$5\frac{3}{8}$″	2000	320	C-8	.95	Street Ltg.	VAW, APB, APD, CPD

CROUSE-HINDS

Accessories and Parts

For Airport Lighting Equipment

Fig. 8

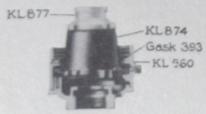


Fig. 9

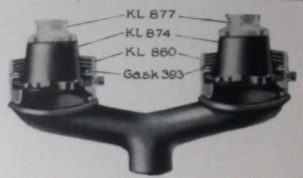


Fig. 10

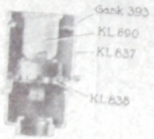


Fig. 11

Fig. 12

Fig. 13

Fig. 14

Parts for Boundary, Obstruction, and Range Lights

Description	Used with Types	Cat. No.
Clear Prismatic Boundary Light Globe (Fig. 8)	VAW, APB	KL846
Red Prismatic Obstruction Light Globe (Fig. 8)	VAW, APB	KL848
Green Prismatic Range Light Globe (Fig. 8)	VAW, APB	KL847
Gasket for Globe Seat (Figs. 9, 10, 11, 12)	VAW, APB	Gask 393
Adjustable Receptacle Mounting Plate for Series Unit (Figs. 11, 12)	VAW, APB (Series)	KL838
Adjustable Receptacle Mounting Plate for Multiple Unit (Figs. 9, 10)	VAW (Multiple)	KL874
Medium Screw Multiple Receptacle (Figs. 9, 10)	VAW (Multiple)	KL877
Series Socket and Receptacle (Figs. 11, 12)	VAW, APB (Series)	KL890
Detachable Globe Ring for Series Unit (Figs. 11, 12)	VAW, APB (Series)	KL837
Detachable Globe Ring for Multiple Unit (Figs. 9, 10)	VAW (Multiple)	KL860

Lamp Receptacles for Other Airport Equipment

Mogul Prefocus Receptacle (Fig. 14)	FCB-12, DCE-16	HL3251
Mogul Bipost Receptacle (New Type) (Fig. 13)	DCE-24	KL577
Mogul Bipost Receptacle and Adapter for Beacons having old type receptacles	DCB-24, DCB-36	7503A
Mogul Bipost Receptacle (New Type) for Beacons	DCB-24, DCB-36	KL979
Medium Bipost Series Socket and Receptacle	CPD	KL996

Lenses for Airport Equipment

25″	3-Section Plate Glass Lens with Center Washers	DCB-24, DCB-224	KL891
25″	Heat-Resisting Red Lens	DCB-24	HL3479
25″	Heat-Resisting Green Lens	DCB-224	HL5390
25″	Plain, Convex, Heat-Resisting Lens	DCE-24	HL2156
25″	10° Spread, Heat-Resisting Lens	DCE-24	KL759
25″	30° Spread, Heat-Resisting Lens	DCE-24	HL2153
25″	80° Spread, Heat-Resisting Lens	DCE-24	HL2154
16 5/16″	Flat, Heat-Resisting Lens	DCE-16	KL883
8 1/2″	Flat, Plain, Heat-Resisting Lens	APD	HL2144
8 1/2″	Flat, Plain, Impact-Resisting Lens	APD	HL4455
360°	Top Dome Fresnel Lens	FCB-12	HL5835
360°	Intermediate Fresnel Lens	FCB-12	HL5836
360°	2-Piece Bottom Section Fresnel Lens	FCB-12	HL5837
360°	Prismatic Lens	CPD	KL990
18″	Clear Inner Doublet Lens	DCB-36	HL3451
18″	Green Inner Doublet Lens	DCB-36	HL3452
18″	Red Inner Doublet Lens	DCB-36	HL3453
20″	Clear Center Outer Lens	DCB-36	HL3457
Outer Lens Sector, Right and Left, Matched (Per Pair)		DCB-36	HL3458

CROUSE-HINDS

Accessories and Parts

For Airport Lighting Equipment

Fig. 1
Complete Focusing Mechanism and Auxiliary Reflector for Type DCE-24 Floodlights

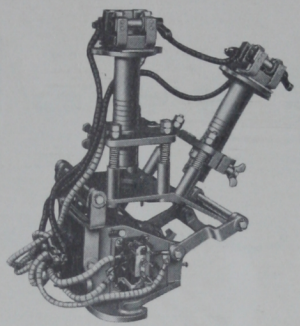


Fig. 2
Lamp-Changer for Type DCB-36 Beacons

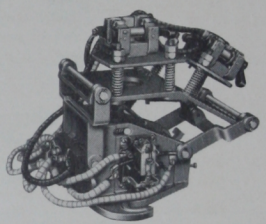


Fig. 3
Lamp-Changer for Types DCB-224 and DCB-24 Beacons

Adapters for Old Style Type DCE-24 Floodlights

The adapter shown in Fig. 1 consists of a complete focusing mechanism with auxiliary reflector and Bipost lamp receptacle for changing over existing installations of type DCE-24 landing field floodlights to use the new Bipost lamps. The auxiliary reflector replaces the louvers formerly used and increases the output of the floodlight by approximately 25%. When the new mechanism has once been installed and adjusted, no further focusing is required when lamp renewals are made.

Description	Cat. No.
Complete Focusing Mechanism and Auxiliary Reflector for 3000-Watt Lamps	HL5794
Complete Focusing Mechanism and Auxiliary Reflector for 1500-Watt Lamps	KL881

Parts for Rotating Beacons

Description	Cat. No.
Lamp-Changer with Bipost Receptacles for DCB-36, 110-Volt. (Fig. 2)	HL8922
Lamp-Changer with Bipost Receptacles for DCB-36, 30-Volt. (Fig. 2)	HL8923
Lamp-Changer with Bipost Receptacles for DCB-224, DCB-24, 110-Volt (Fig. 3)	HL8924
Lamp-Changer with Bipost Receptacles for DCB-24, 30-Volt (Fig. 3)	HL8925
Motor for DCB-36, DCB-24, or DCB-224, 110-Volt, 60-Cycle A. C.	KL887
Bronze Worm for use with Micarta Gear for all Beacons	HL4390
Worm Gear with Micarta Ring for all Beacons with Disc Clutch	HL4391
Worm Gear with Micarta Ring for old Type DCB-24 with Spring Type Leather Clutch	HL5192

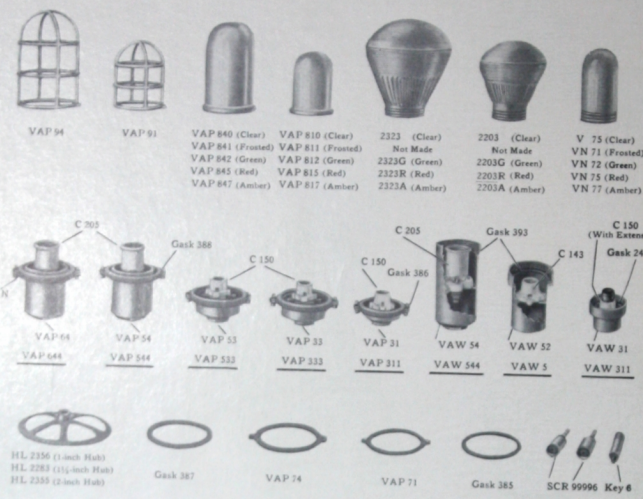
Prices on application.

CROUSE-HINDS

Accessories and Parts

For Obsolete Types of Boundary, Obstruction, and Range Lights

Listed in Section 304, Page 7



Description	VAP Form 1	VAP Form 3	VAP Form 4	VAW Form 1	VAW Form 2	VAW Form 4
Body Complete with Receptacle and Gasket, 1-Inch Hub	VAP311	VAP333	*	VAW311	*	*
Body Complete with Receptacle and Gasket, 1½-Inch Hub	*	VAP533	VAP544	*	VAW5	VAW544
Body Complete with Receptacle and Gasket, 2-Inch Hub	*	*	VAP644	*	*	*
Body Casting, 1-Inch Hub	VAP31	VAP33	*	VAW31	*	*
Body Casting, 1½-Inch Hub	*	VAP53	VAP54	*	VAW52	VAW54
Body Casting, 2-Inch Hub	*	*	VAP64	*	*	*
Medium Screw Base Receptacle	C150	C150	*	C150	C143	*
Series Socket and Receptacle	*	*	C205	*	*	C205
Globe Seat Gasket	Gask 386	Gask 388	Gask 388	Gask 24	Gask 393	Gask 393
Clamp Ring Gasket	Gask 385	Gask 387	Gask 387	*	*	*
Globe Clamping Ring	VAP71	VAP74	VAP74	*	*	*
Guard	VAP91	VAP94	VAP94	*	*	*
Clear Globe (Clamp Style)	VAPS10	VAP840	VAP840	*	*	*
Frosted Globe (Clamp Style)	VAPS11	VAP841	VAP841	*	*	*
Green Globe (Clamp Style)	VAPS12	VAP842	VAP842	*	*	*
Red Globe (Clamp Style)	VAPS15	VAP845	VAP845	*	*	*
Amber Globe (Clamp Style)	VAPS17	VAP847	VAP847	*	*	*
Clear Holophane Globe (Screw Base)	*	*	*	2203	2323	2323
Green Holophane Globe (Screw Base)	*	*	*	2203G	2323G	2323G
Red Holophane Globe (Screw Base)	*	*	*	2203R	2323R	2323R
Amber Holophane Globe (Screw Base)	*	*	*	2203A	2323A	2323A
Clear Plain Globe (Screw Base)	*	*	*	V75	*	*
Frosted Plain Globe (Screw Base)	*	*	*	VN71	*	*
Green Plain Globe (Screw Base)	*	*	*	VN72	*	*
Red Plain Globe (Screw Base)	*	*	*	VN75	*	*
Amber Plain Globe (Screw Base)	*	*	*	VN77	*	*

Knurled Slotted Head Screw Locking Screw. For Locking Screw	9681N
Key	SCR99996
Wheel Base. For 1-Inch Pipe Boundary Light Standards	Key 6
Wheel Base, 12-Inch Diameter. For 1½-Inch Pipe Boundary Light Standards	HL2356
Wheel Base. For 2-Inch Pipe Boundary Light Standards	HL2283
	HL2355

*Not made.

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CROUSE-HINDS

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2323G	Globe	307	4
2323R	Globe	307	4
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9681-N	Screw	307	4
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40775	DCE-24	302	3
40783	DCE-24	302	3
40926A	APD	304	9
40927A	APD	304	9
40930A	APD	304	9
40931A	APD	304	9
40944	APB boundary light	304	8
40945	APB boundary light	304	8
40946	APB range light	304	8
40947	APB obstruction light	304	8
40954A	APD	304	9
40955A	APD	304	9
41028A	APD	304	9
41029A	APD	304	9
41030A	APD	304	9
41031A	APD	304	9
41252C	FCB-12	301	5
41257C	FCB-12	301	5
41258C	FCB-12	301	5
41281	DCB-36	301	1
41300A	APD	304	9
41304	DCB-36	301	1
41417A	APD	304	9
41418A	APD	304	9
41419A	APD	304	9
42099	DCE-16	303	1
42100	DCE-16	303	1
42196C	FCB-12	301	5
42197C	FCB-12	301	5
42198C	FCB-12	301	5
42391	MUA	305	12
42392	MUA	305	12
42393	MUA	305	12
42394	MUA	305	12
42395	MUA	305	12
42396	MUA	305	12
42397	MUA	305	12
42398	MUA	305	12
42399	MUA	305	12
42461	MDB-14	305	12
42462	MDB-14	305	12
42465	MDB-16	305	12
42466	MDB-16	305	12
42482	DCE-24	302	3
42484	MDB-16	305	12
42485	MDB-16	305	12
42487	MDB-14	305	12
42488	MDB-14	305	12
42490	MDB-16	305	12
42491	MDB-14	305	12
42492	MDB-16	305	12
42493	MDB-16	305	12
42495	MDB-14	305	12
42496	MDB-14	305	12
42498	MDB-16	305	12
42499	MDB-16	305	12
42721	MDB-14	305	12
42722	MDB-14	305	12
42733	APB boundary light	304	4
42734	APB range light	304	4
42735	APB obstruction light	304	4
42749	Plug and receptacle	304	6
42750	Plug and receptacle	304	4
42930	RMF-12	306	3
42938	DCE-24	302	3
42939	DCE-24	302	3
42940	DCE-24	302	3
42954	Wind cone lighting fixture only	305	1
42955	Wind cone support complete	305	1
42956	Wind cone support complete	305	1
42957	APB boundary light	304	6
42958	APB range light	304	6
42959	APB obstruction light	304	6
42960	Boundary light assembly	304	6
42961	VAW body only	304	6
42963	VAW body only	304	4
42967	VAW boundary light	304	6
42968	VAW range light	304	6
42969	VAW single obstruction light	304	6
42970	VAW double obstruction light	302 304	5 6
42971	VAW single obstruction light	304	4
42972	VAW double obstruction light	302 304	5 4
42985	VAW boundary light	304	4
42986	VAW range light	304	4
42988	VAP multiple unit	304	7
42989	VAP multiple unit	304	7
42990	VAP multiple unit	304	7
42991	VAP multiple unit	304	7
42992	VAP multiple unit	304	7
42993	VAP multiple unit	304	7
42994	VAP multiple unit	304	7

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